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MONTANA AIR MONITORING

NETWORK REVIEW

FOR 1993

Compiled by:

Robert Jeffrey

Kelly Maas

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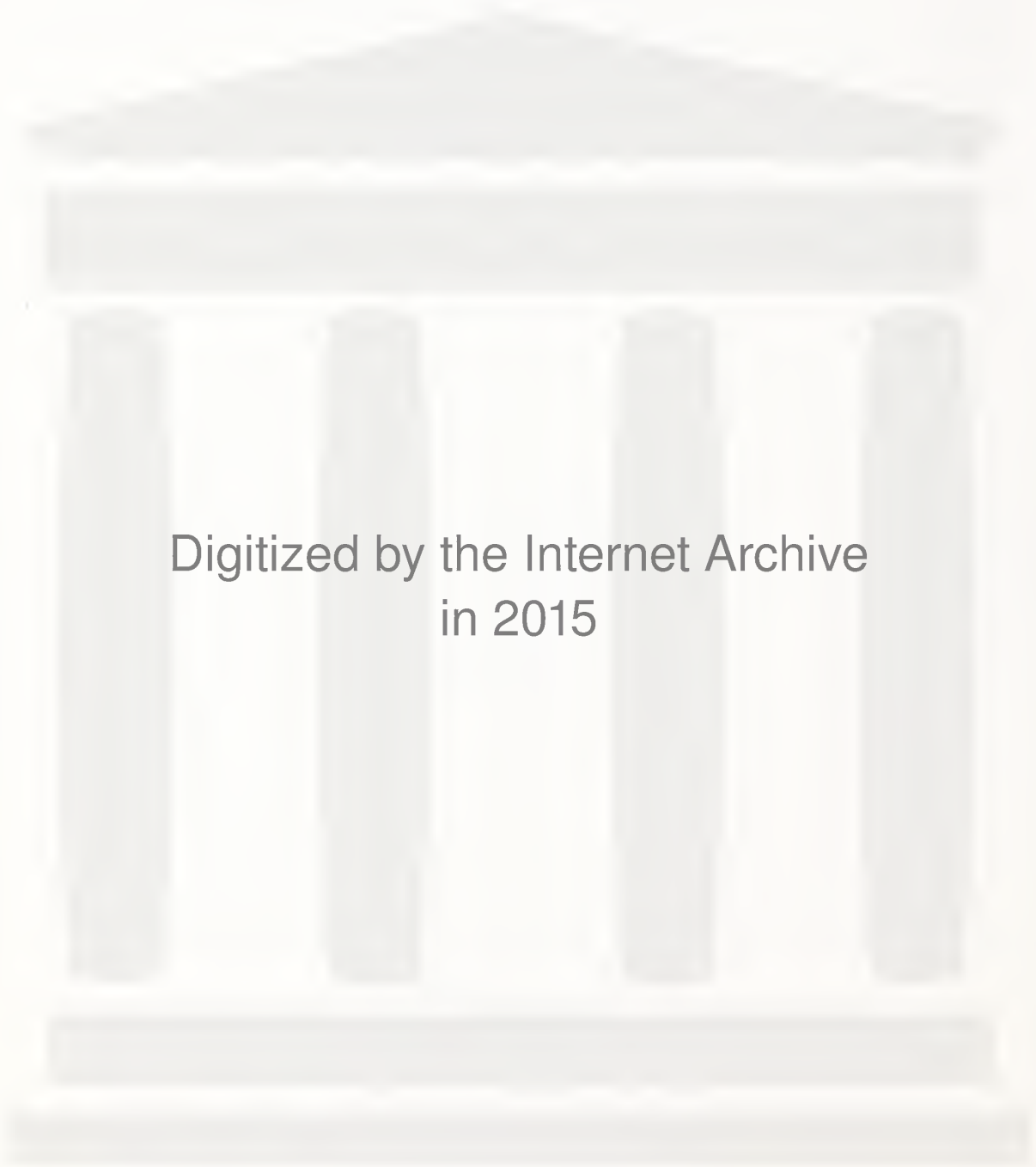
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MONTANA AIR MONITORING NETWORK REVIEW FOR 1993

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) requires the Montana Department of Health and Environmental Sciences (MDHES) to conduct an annual review of the state's ambient air monitoring network.

The 1993 Network Review follows a format that was used for the 1991 Network Review. There was no formal review conducted in 1992, the newtwork changes made in 1992 are reviewed in the 1993 report. Each year the department also publishes an air quality data and information summary. This document is available upon request.

EPA's requirements for an annual network review are set forth in 40 CFR 58.20(d). These requirements say that the state must conduct a review (1) to determine if the system meets the monitoring objectives defined in Appendix D of Part 58, and (2) to identify needed modifications of the network, such as the termination or relocation of unnecessary stations or the establishment of new stations that may be necessary.

The department is required by 40 CFR 58.25 to develop and implement an annual schedule modifying the network in order to eliminate any unnecessary stations or to correct any inadequacies indicated by the results of the annual review. The department must consult with the Regional Administrator of EPA during the development of the schedule to modify the monitoring program. The final schedule and modifications are subject to the approval of the Regional Administrator.

This document and subsequent revisions are intended to satisfy those annual requirements.

1.1 NETWORK REVIEW PROCESS

In order to conduct this review, the monitoring objective and the spatial scale of representativeness of each station, existing or proposed, are first examined to determine whether they represent the air quality situation of the area. Background information, such as maps, climatological summaries, emission inventories, traffic counts, and modeling results are gathered and reviewed. The opinions of the department staff, the personnel of the seven approved county air pollution agencies, as well as several other county health agencies, and staff members of EPA are also solicited.

In the 1979 Network Review, the department designated each monitoring site in the state as either National Air Monitoring Station (NAMS), State and Local Air Monitoring Station (SLAMS), or Special Purpose Monitoring station (SPM). The NAMS/SLAMS network is designed to meet four basic monitoring objectives. The basic monitoring objectives are as follows:

1. To determine highest concentrations expected to occur in the area covered by the network.

2 To determine representative concentrations in areas of high population density.

3. To determine the impact on ambient pollution levels of significant sources or source categories.

4. To determine general background concentration levels.

The link between the basic monitoring objectives and the physical location of a particular monitoring site involves the concept of spatial scales of representativeness. The spatial scale is determined by the physical dimensions of the air parcel nearest a monitoring station throughout which the actual pollutant concentrations are reasonably similar. The goal in siting stations is to match the spatial scale represented by the sample of monitored air with a spatial scale most appropriate for the monitoring objective. Spatial scales of representativeness, as specified by EPA, are described below:

Microscale - defines the concentrations in air volumes associated with area dimensions ranging from several meters up to about 100 meters.

Middle scale - defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.

Neighborhood scale- defines concentrations within some extended area of the city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometer range.

Urban scale - defines the overall, citywide conditions with dimensions on the order of 4 to 50 kilometers. This scale would usually require more than one site for definition.

Regional scale -	defines usually a rural area of reasonable homogeneous geography and extends from tens to hundreds of kilometers.
National and Global scales -	these measurement scales represent concentrations characterizing the nation and the globe as a whole.

In order to site a monitoring station properly, both the monitoring objective and the spatial scale of representativeness must be determined. Appropriate siting scales for the various monitoring objectives are listed below.

Monitoring Objective	Siting Scales
Highest Concentration	Micro, middle, neighborhood (sometimes urban)
Population	Neighborhood, urban
Source Impact	Micro, middle, neighborhood
Background	Neighborhood, regional

The goal in siting stations is to match correctly the spatial scale represented by the sample of monitored air with the spatial scale most appropriate for each station's monitoring objective. The use of this physical basis for locating stations allows for an objective approach, ensures compatibility among stations and provides a physical basis for the interpretation and application of data. The annual review process involves an examination of existing stations to evaluate their monitoring objectives and spatial scale. The results of this review will determine whether sites are deleted, added, or modified. Further details on network design can be found in Appendix D to 40 CFR 58.

1.2 GENERAL MONITORING NEEDS

Montana is a large state (147,138 square miles - fourth largest in the nation) but has a fairly small population (799,065 - 1990 census). Most of the Big Sky Country (a nickname coined for the state) is pristine and altered little by man's hand. This is not to say that the state is not without its air quality problems. There are some places where air quality is a fragile resource.

1.2.1 PARTICULATES

Particulate matter is Montana's major air pollution problem and receives the highest priority from department staff. The major sources of particulates are traffic on paved and unpaved roads,

residential wood combustion, industrial activity, coal mines, and agricultural activity. For years the state was concerned with total suspended particulates (TSP) and sought ways to control its sources. As a result of the 1977 amendments to the Clean Air Act, several areas of the state were designated non-attainment of either the primary or secondary standard for TSP. The department developed State Implementation Plans (SIP) to bring the areas into compliance and although control strategies were implemented, they were sometimes inadequate to bring the area into compliance. In some cases, the source mix changed before the area was shown to be in compliance.

On July 31, 1987, the EPA promulgated new ambient air quality standards for particulate matter. The new standards changed the focus from larger particles (TSP) to smaller inhalable particles known as PM-10 (particles with an aerodynamic diameter less than 10 microns). As a result of this standard, the EPA assigned various parts of Montana to one of three categories. Seven communities were identified as Group I areas (likely to violate the standards), six as Group II areas (may violate the standards) and the rest of the state was considered Group III. Group III areas are not necessarily in compliance since data may not be available for determination. Since this original classification, two of the Group II areas have exceeded the standard. They are called "Group II with exceedances" but are treated as Group I. Due to provisions in the Clean Air Act Amendments of 1990, all Group I areas and Group II areas with exceedances were designated non-attainment. The non-attainment provisions of the Clean Air Act mandate definite schedules to show attainment and provide for sanctions and federal oversight if the scheduled dates are not met.

The department has been heavily involved with monitoring and planning activities and is developing SIPs to bring non-attainment areas into compliance. Montana has 11% of the nation's PM-10 non-attainment areas requiring a significant commitment of resources for the SIP development process.

1.2.2 SULFUR DIOXIDE

Sulfur dioxide (SO_2) is another pollutant of concern in the state. There are only three areas in the state where SO_2 is an issue or a problem. These are the Billings/Laurel area, East Helena, and Colstrip. In all cases the sources for SO_2 are industrial point sources.

In the Billings/Laurel area, the industrial sources of SO_2 include a coal-fired power plant, three oil refineries, a sugar beet processing facility and a sulfur recovery facility. The combined source mix contributes to some fairly high ambient readings. In 1977, the Laurel area was designated non-attainment for SO_2. In December, 1977 a stipulation was signed with the

Billings/Laurel industries and the state. This stipulation was incorporated into the SIP and was the tool to bring the area into compliance. Subsequent monitoring networks for SO_2 have shown the area to be in compliance with the national ambient air quality standards (NAAQS) but exceeding the Montana ambient air quality standards (MAAQS).

In 1987, the Montana legislature passed a bill changing the MAAQS to NAAQS for existing sources in the Billings/Laurel area. Following the session, a committee of the Billings/Laurel industries, the local chamber of commerce, and air pollution professionals formed to monitor and report on the area's air quality. The aim of the committee was to arrive at some solutions to the SO_2 problem of the area. Due to interest by the EPA and environmental groups, the state and Billings/Laurel industries conducted peak five-minute monitoring for SO_2 during the winter of 1990-91. An EPA contractor reviewed the peak five-minute data and its relationship to the hourly averages (peak-to-mean ratios). The results of this review were inconclusive. No additional peak five-minute monitoring for SO_2 is planned by the Billings/Laurel industries. However, the state continues to collect peak five-minute SO_2 data at it's sites.

In East Helena, the industrial source of SO_2 is a primary lead smelter. In 1977, the area was designated non-attainment for SO_2. The smelter installed an acid plant and modified stacks to reduce sulfur dioxide emissions. Data from samplers in the immediate vicinity of the smelter have shown exceedances but no violations of the NAAQS or MAAQS. There were some "violations" of the three-hour NAAQS in 1987 at an SO_2 site about four miles from the smelter near a cement manufacturing facility. A data review did not determine any cause for the high readings and it was difficult to determine if the readings were valid. No other violations have occurred since that time.

In April, 1991, EPA notified the department that the East Helena SO_2 SIP was inadequate, and needed to be revised and submitted to EPA by May 1992. This request was driven by an inadequate GEP stack height analysis and requirements in the Clean Air Act Amendments of 1990. As of this date the SIP for the primary SO_2 standard is overdue. It is anticipated that this SIP will be submitted to EPA in October, 1993.

In Colstrip, the industrial sources for SO_2 are four coal-fired power plants. Colstrip Units #1 and #2 were permitted in 1973 by the state. Unit #1 was commissioned in October 1975 and Unit #2 in August 1976. The units utilize wet scrubbers for SO_2 control with an efficiency of 70%.

In 1978, EPA issued a permit for Colstrip Units #3 and #4. EPA was the issuing agency because, at that time, the state had not

been delegated PSD permitting authority. The issue of impact on the Northern Cheyenne PSD Class I area resulted in higher stacks and greater control efficiencies for Units #3 and #4. These units use wet scrubbers with lime injection resulting in an SO_2 control efficiency of 90%.

The company maintains an ambient network around the facility and supports a tribal air monitoring program on the Northern Cheyenne reservation. Data submitted by the company are very low and show no violations of the NAAQS or MAAQS.

1.2.3 LEAD

Lead is a pollutant of concern in East Helena where the predominant source is the ASARCO primary lead smelter. The EPA promulgated ambient air quality standards for lead on October 5, 1978 and based on monitoring data, the East Helena area was determined to be in violation of the lead standard. The department conducted extensive studies in the early 1980's to determine source apportionment. A SIP was developed and approved by the EPA in 1984 which contained control strategies expected to bring the area into compliance.

As of December 31, 1986, all the control strategies in the plan were implemented but ambient air monitoring data for 1987 and 1988 indicated that although lead levels decreased, they remained above the lead standard. As a result, the EPA notified Montana on October 1, 1988, that the East Helena lead SIP was inadequate.

During the last half of 1990 and the first half of 1991, the state and involved companies conducted ambient monitoring, emission inventory estimations, source apportionment studies, meteorological data collection, and dispersion modeling in support of a second, or revised SIP. The second SIP, although substantially complete and submitted to the EPA for approval, was not approved before the 1990 Clean Air Act Amendments. A revised SIP for East Helena is scheduled to be submitted to the EPA for approval by April 1, 1994.

1.2.4 CARBON MONOXIDE

Carbon monoxide (CO) is a pollutant of concern in the larger communities in Montana. Currently, there are three CO non-attainment areas in Montana; these are Missoula, Great Falls and Billings. Automobile exhaust is the principal source of CO emissions in these communities. Other sources include industrial emissions as well as agricultural and forestry burning. In western Montana, including Missoula, residential wood combustion is a contributing source to ambient CO levels.

The department, in cooperation with the various county air pollution agencies, monitors for CO in Missoula, Great Falls and

Billings. Most high concentrations occur in the wintertime due to stagnant weather conditions, cold temperatures, and poor fuel combustion from the various sources.

In 1989, the department conducted and submitted CO emission inventories in the three non-attainment areas to EPA. The department never received comments from EPA on the adequacy of these emission inventories. New draft emission inventories using 1990 as a base year were submitted to EPA in the summer of 1992. The department received EPA's comments on these new inventories in December, 1992. The final CO emission inventories are expected to be submitted to EPA in December, 1993. Additional controls for CO in Missoula were gained by implementing an oxygenated fuels program on November 1, 1992.

Due to provisions in the Clean Air Act Amendments of 1990, Missoula was categorized as a "moderate" non-attainment area. This label was given because the design value was between 9.5 ppm and 12.7 ppm for an eight hour period. The state submitted a revised SIP to EPA for Missoula, based on the oxygenated fuels program changes, on November 6, 1992. Billings and Great Falls were categorized as "interim" or "transitional" under the CAAA. This label was given because the design values for these communities were less than 9 ppm. The state plans to submit community-specific maintenance plans to EPA, for these two communities, at the time the re-designation requests are made.

1.2.5 OZONE

Ozone (O_3) is not a pollutant of concern in Montana. All areas of the state are considered attainment for ozone. Unlike most other pollutants, O_3 is not generally emitted directly into the atmosphere but results from a complex photochemical reaction between volatile organic compounds (VOC), oxides of nitrogen (NOx), and solar radiation. Both VOC and NOx are emitted directly into the atmosphere from sources within the state. Since solar radiation is a major factor in O_3 production, O_3 concentrations are expected to peak in the summer months.

The department conducted O_3 monitoring in Billings in 1988 and 1989. Billings is in an area where sources emit fairly large quantities of VOC and NOx. Billings also has hot summer days which may promote photochemical reactions. The data collected showed higher concentrations in the summer months but were all within the NAAQS.

1.2.6 NITROGEN DIOXIDE

Nitrogen dioxide (NO_2) is not a pollutant of concern in Montana. NO_2 is formed when nitric oxide (NO) is oxidized in ambient air. Oxides of nitrogen (NOx) is a term used to represent

both NO_2 and NO. Emission inventories for point and area sources are usually expressed as NOx whereas the standard is for NO_2.

Point sources of NO or NO_2 in the state include coal-fired power plants, natural gas compressor stations, and other miscellaneous industries such as oil refineries and a kraft pulp mill. Mobile sources include tailpipe emissions from automobiles.

The department itself has not performed NO_2 monitoring in the last seven years. However, there has been some company monitoring for NO_2 in Colstrip and Missoula. These monitoring activities were required as conditions of PSD permits. Data submitted by the companies have shown no violations of the NAAQS or MAAQS.

1.2.7 AIR TOXICS

Air Toxics is a term that covers a far-ranging suite of hazardous substances, emitted in either gaseous or particulate phases. For many years the only air toxics measured in Montana were various heavy metals (e.g. lead, arsenic, cadium, chromiun, etc.) that are associated with particulate emissions from the minerals extraction industry.

Sources of air toxics are as diverse and as numerous as the compounds themselves. Some point sources which emit air toxics include the oil and gas industry, minerals extraction and processing, chemical and cement plants, and the wood products industry. Some area-wide sources of air toxics include dry cleaners, gas stations, residential wood combustion and motor vehicle repair/refinishing facilities. Mobile sources include tailpipe emissions from automobiles, light and heavy-duty trucks, trains and airplanes.

The department and Missoula County are planning a formaldehyde screening study, in Missoula, for the winter of 1993-94. There are potential screening studies, for various gaseous compounds, being discussed for the cities of Billings and Missoula. Completion of these studies is contingent on receiving both federal funds and spending authority from the Montana Legislature. Tentatively, the studies are scheduled for 1994.

1.3 MONITORING OBJECTIVES

From the inception of the Montana air quality program, the department has developed and maintained an air monitoring network covering problem areas throughout the state. In the mid to late 1960s the department used high volume samplers (hi-vols), dustfall jars, "Montana Boxes" (for fluoride), and sulfation plates to assess ambient air quality impacts from various sources. Initial program development selected monitoring locations based on field

investigations, complaints, surveys, public interest and professional judgement of the staff.

In the early to mid-1970s, other monitoring devices came on the scene. These included gas bubblers for SO_2 and NO_2, hi-vols with metal shelters (early versions were made of wood), and continuous analyzers particularly for SO_2. During these years, metal analysis was begun on hi-vol filters collected near smelting and mining activities.

From mid to late 1970s, the monitoring effort was refined as state-of-the-art equipment was becoming available and being deployed in the field. The state became involved in several special-purpose air pollution studies. The department was involved with the Montana Air Pollution Study (MAPS) which conducted extensive ambient air monitoring in Anaconda, Butte, Billings and Missoula. The purpose of the study was to relate air pollution concentrations with measured human health effects within and between the different communities. The department published several documents detailing the results of these studies.

At about the same time, the department was also involved with investigative and background studies for the Flathead River Basin EIS (Kalispell, Columbia Falls, Polson, etc.), Poplar River project (by Scobey in northeast Montana), and energy development in eastern Montana (particularly in the Colstrip area).

As a result of the 1977 Amendments to the Clean Air Act, several areas in Montana were designated non-attainment for various NAAQS based on air quality data. Air quality monitoring increased in these areas as SIPs were being developed. Field sampling, emission inventory estimates and dispersion modeling allowed staff to focus on worst-case or maximum concentration sites. This applied mostly to CO and TSP non-attainment areas.

In 1978, the EPA promulgated a standard for lead (previously discussed). Emphasis on lead monitoring and investigations to determine maximum concentration sites were conducted in the East Helena area as part of the original SIP. The present day network evolved from this study.

In 1981-82, an SO_2 surveillance network was established as a condition of the 1977 Stipulation with the Billings/Laurel industries and the state. The network, at that time, contained eight SO_2 monitoring sites equipped with meteorological sensors and one upper air station. Industrial locations, topography, wind roses, emission estimates and past ambient data were used to situate the sites in maximum concentration locations or where the public may be affected.

In East Helena and Colstrip, monitoring networks were set up which essentially encircled the point sources. These multiple site networks allow adequate coverage (regardless of the wind direction) to determine maximum concentrations from the sources.

Quality control and assurance were always considered and performed as part of the collection of the data. The state's application of quality assurance, monitoring methodology, probe siting and network design was good but not necessarily consistent with others in the nation.

At the request of the Deputy Administrator of the EPA, the Standing Air Monitoring Work Group (SAMWG) was formed in 1975. This group was made up of people representing state and local air pollution control agencies, EPA Headquarters and EPA regional offices. The purpose of the group was to critically review and evaluate current air monitoring activities, develop more effective air monitoring strategies, help correct identified problems, improve overall current operations and meet projected air monitoring goals.

Attempting to correct some air monitoring deficiencies, SAMWG developed a number of recommendations. These were promulgated in the Federal Register on May 10, 1979 and later updated on March 19, 1986 and July 1, 1987 (40 CFR Part 58).

The areas covered included:

Appendix A - Quality Assurance Requirements for State and Local Air Monitoring Stations.

Appendix B - Quality Assurance Requirements for Prevention of Significant Deterioration (PSD) Air Monitoring.

Appendix C - Ambient Air Quality Monitoring Methodology.

Appendix D - Network Design for State and Local Air Monitoring Stations and National Air Monitoring Stations.

Appendix E - Probe Siting Criteria for Ambient Air Quality Monitoring.

Appendix F - State and Local Air Monitoring Stations Air Quality Annual Report.

Appendix G - Uniform Air Quality Index and Daily Reporting.

Appendices D and E include network review, design and siting criteria. In the state's first network review (1979 Network

Review), the department designated each monitoring site in the state as either a National Air Monitoring Station (NAMS), State and Local Air Monitoring Station (SLAMS), or Special Purpose Monitoring station (SPM). The NAMS/SLAMS network was developed to meet the four basic monitoring objectives as listed in Section 1.1 above. Some stations are established which have more than one monitoring objective. For instance, a station may be in an area where the highest concentration would be expected to occur but would also be representative of a population area.

Table 1 at the end of this report gives a brief description of the state-wide ambient air monitoring network. The table lists all sites operated by the department, county agencies and some operated by industrial concerns. The table provides a narrative regarding any changes or modifications to the sites. It also lists any proposed sites. Table 2 provides a short list of all sites listed in Table 1 without the narrative.

2.0 AMBIENT MONITORING NETWORK COVERAGE

This section addresses air quality problems and concerns in Montana. It is a continuation of discussions presented in Section 1.2 regarding specific pollutants and problem areas. Each of the EPA criteria pollutants is discussed regarding what data has been collected and the results. This section also contains the approach used by the department to select and maintain site locations (continuation of Section 1.3) and the current air monitoring coverage. Each pollutant is discussed individually within specific sections for each Air Quality Control Region (AQCR) and county.

The review analyzes emissions, ambient, meteorological and other data related to specific sites or problem areas. The review is intended to show that existing monitoring sites should continue to operate because they still serve a purpose or are not needed and should be terminated. There are some instances where some sites may need to be modified in order to meet an intended purpose.

The 1993 Network Review contains a section dealing with meteorological data collection. The department uses various weather instruments to measure parameters such as wind speed, wind direction, temperature and so forth. These values are used in support of the analysis of air pollution data and to estimate pollutant concentration through dispersion models.

2.1 SULFUR DIOXIDE AREAS

As mentioned in Section 1.2.2, there are only three areas in the state where SO_2 is an issue or concern. These are the Billings/Laurel area in Yellowstone County, East Helena in Lewis & Clark County, and Colstrip in Rosebud County.

2.1.1 AQCR 140 - SOUTH CENTRAL MONTANA

2.1.1.1 YELLOWSTONE COUNTY

The sulfur dioxide issue in Yellowstone County has been with the air quality program since its inception in the mid to late 1960s. Early monitoring with sulfation plates and SO_2 analyzers showed that the Laurel area exceeded air quality standards and the Billings area measured elevated levels.

There are six major sources in the Billings/Laurel area which emit SO_2. In Billings, these include Exxon (oil refinery), Conoco (oil refinery), Montana Power (coal-fired electric power generating facility), Western Sugar (sugar beet factory), and Montana Sulphur & Chemical (sulfur recovery facility). In Laurel, the major source is the Cenex oil refinery. Emissions of SO_2 for these sources for 1992 were estimated to be around 33,560 tons/year.

Billings and Laurel are situated along the Yellowstone River valley in south central Montana. The Yellowstone River valley runs from southwest to northeast and is a predominant topographical influence on the airflow in the area. In Billings, there are cliffs or rimrocks located both north and south of the river which also tend to cause channeling. The distance between the north and south rims range from about one to five miles. In Laurel, the valley tends to be a little wider and the predominant high terrain is not close by. The cities of Billings and Laurel and all of the industrial sources are located along the river valley. Nearby terrain is often higher than the highest smoke stacks.

Wind roses in the area are reflective of the valley orientation. The predominant wind direction is from the SW with NE being the second most predominant direction. As with many areas in Montana, the area experiences inversions in the fall and winter months. This causes pollutants to become trapped and build up for extended periods. Inversion breakup occurring after sunrise causes built-up concentrations to lower to the ground and results in elevated readings measured at the monitoring stations. With frontal passage or higher wind speeds, winds can cause plumes to directly impact the ground resulting in high SO_2 concentrations.

In 1977, a stipulation was signed between the department and the Billings/Laurel industries. The stipulation (requiring the industries to employ various control options) was the framework used to bring the area into compliance with ambient standards. In 1978, the Laurel area was designated non-attainment of the NAAQS for SO_2. The stipulation became part of the SIP and was approved by EPA. The 1977 stipulation also commissioned the department (with industrial funding) to conduct an ambient air quality study to more fully describe the magnitude and geographical extent of the SO_2 concentrations. Another major goal of the study was to identify the relative source contributions from each industry.

In 1981-82, the department (through a cooperative effort with the industries) designed and installed a sulfur dioxide monitoring network. The network consisted of eight SO_2 monitoring sites with meteorological monitors and an upper air site employing acoustic radar and pilot balloons. Six of the SO_2 sites were in Billings and two were in Laurel. Using this data, the department attempted to validate a mathematical model that could predict concentrations from the various SO_2 sources. These attempts failed due to the following reasons: (1) a lack of good emissions data; (2) high concentrations caused by inversion breakup and direct plume impact (which the model could not handle); (3) over-prediction of plume rise by the model; and (4) receptors being so close to the sources that small changes in wind direction could cause large differences in predicted versus actual concentrations. A novel approach was developed using directional analysis and mass emissions to characterize source contributions to the annual average at the

worst-case receptor. This was useful but could not be applied as a predictive tool for short-term averages or at other receptors in the valley.

Following the 1981-82 study, the SO_2 monitoring network was scaled down in various stages until it reached a minimum in early 1987. As mentioned previously, eight SO_2 monitoring stations were in operation in 1982 during the SO_2 study. Following the conclusion of that study, the network was scaled down to four sites in 1983. These included Coburn Road (30-111-0066), Lockwood Park (30-111-0065), North Johnson Lane (30-111-0064) and Taft School (30-111-0064). It should be noted that all of the Laurel sites were terminated since the two sites in the 1981-82 study showed compliance with the NAAQS and MAAQS and the department felt that greater emphasis was needed in the Billings/Lockwood area. In December 1983, the Taft School site was shut down to reduce the operator's workload in Billings. The network of three sites continued until June 1986 when a leasing problem caused the department to shut down the North Johnson Lane site. In January 1987, the department shut down its Lockwood Park site due to further cutbacks of personnel in the Billings office. At that time the network was reduced to a single site (Coburn Road) which has been the backbone of the network.

During 1984 to 1986, the department explored rule-making options to bring the area into compliance with the SO_2 MAAQS. With no easy administrative solutions in sight, the Montana Legislature passed HB 534 in the 1987 session. This bill exempted the existing Billings/Laurel industries from meeting the MAAQS; they had only to meet the NAAQS (which was being met in Yellowstone County). Acknowledging the state's diminishing role in SO_2 monitoring in Billings, the legislature passed HB 878 which provided state funding for continued monitoring. With this funding the state was able to add one additional site [Scottish Rites (30-111-0073)] to its network.

At the same time, the six Billings/Laurel industries combined resources to address SO_2 issues including monitoring. The Billings/Laurel Air Quality Technical Committee (BLAQTC) was formed in the spring of 1987. BLAQTC hired a contractor, purchased equipment and installed three SO_2 monitoring stations. Two of the sites were in Billings [Lockwood Park (30-111-1065) and Coulson Road (30-111-2004)] and one was in Laurel [Laurel-BLAQTC (30-111-2004)]. The department is a non-paying member of BLAQTC and cooperatively works with the group with site selection, quality assurance, etc. By the end of 1987 the combined state and BLAQTC network consisted of five sites.

This monitoring network remained the same until October 1989. Upon agreement with the department and BLAQTC, the Scottish Rite site was moved to Ponderosa School (30-111-0076) and the Coulson

Road site was moved to Brickyard Lane (30-111-2005). The group felt that the old sites had served their purpose and that higher SO_2 concentrations might be found at the new sites. The department documented the recent SO_2 monitoring sites in forms sent to EPA on 1-5-90. EPA approved all of these sites in a letter dated 5-14-90.

On June 30, 1992 the Ponderosa School site was shut down due to low readings. This action was approved by EPA in a letter dated 6-22-92. The Ponderosa monitoring shelter was moved to the Coburn Road location, approximately 30 feet west of the existing air monitoring trailer. In an attempt to reduce vandalism, the instruments in the original Coburn Road trailer were moved to the new (i.e., old Ponderosa) shelter on 10-1-92. A letter, along with photographs documenting the move was sent to EPA on 10-29-92. The old Coburn Road trailer was surplused.

In 1990, EPA hired a contractor to develop an SO_2 emission inventory for the Billings-Lockwood-Laurel area. The final report was submitted during February, 1991. Also in 1990, the City of Billings hired a contractor to perform a dispersion modeling study for the Billings-Lockwood-Laurel area utilizing recently gathered meteorological data and the updated emission inventory. The preliminary results of the dispersion modeling study indicated that potential violations of the SO_2 NAAQS existed using allowable emission rates as well as at actual emission levels. In some cases the model predicted high SO_2 concentrations in areas where air monitoring had never been conducted. In July, 1990 Billings Generation,Inc. (BGI) applied for a permit to construct a coke-fired, power generation facility adjacent to and utilizing petroleum coke from the Exxon refinery. Dispersion modeling by BGI, required as part of the permitting process, indicated elevated SO_2 levels in the Lockwood area. The department reviewed and refined the results of the modeling studies and concluded that additional SO_2 monitoring sites were needed.

The department installed an SO_2 monitor at the modeled maximum SO_2 "hot-spot". The site was named Sacrifice Cliff (AIRS# 30-111-0080) and data collection started on May 19, 1993. The department submitted a network modification form to EPA on May 24, 1993 requesting approval of this site. EPA responded in a letter dated July 7, 1993 approving this as a SLAMS site. As a result of the permitting process, BGI will install and operate SO_2 monitors at two other modeled "hot-spots". The first one, scheduled for start-up in October, 1993, will be near Johnson Lane, south of I-90, and east of the existing Lockwood Park site. The second site will be east of the I-90/I-94 junction, in the elevated terrain near the Pine Hill School.

In November 1988, the department started collecting peak five-minute SO_2 averages for each hour. The EPA met with the department and BLAQTC in February 1990 and offered two SO_2 analyzers to

conduct peak monitoring in the range from 1 to 5 ppm. In September 1990, the department and BLAQTC installed one of these monitors at the Coburn Road site and the other at the Lockwood Park site. These monitors collected peak five-minute data for six months until the end of March, 1991. Peak data was also collected at the other three sites with analyzers in the range of 0 to 1 ppm. After completion of the study, an EPA contractor reviewed and analyzed the data; the results were inconclusive. The department continues to collect peak five-minute SO_2 data but none is collected at the industry sites. If frequent off-scale (i.e., <1.0 ppm) excursions are measured at the state-operated sites, the department may decide to operate the SO_2 analyzers on a higher range. Currently this is not seriously being considered due to the lack of a short-term (i.e., five-minute) SO_2 NAAQS.

The department feels the current network is adequate and several of the sites could be considered "maximum concentration sites" depending on wind and weather conditions. There are no plans to change the network in the near future except for the possible relocation of the BLAQTC-operated Brickyard Lane site to the Billings Heights area.

2.1.2 AQCR 142 - SOUTHWESTERN MONTANA

2.1.2.1 LEWIS & CLARK AND JEFFERSON COUNTIES

The sulfur dioxide issue in Lewis & Clark County (and Jefferson County) has been dealt with for a number of years. ASARCO's primary lead smelter is the only major point source for SO_2 in the East Helena area. In 1992, the ASARCO primary lead smelter emitted approximately 18,251 tons/year of SO_2. The ASARCO smelter is located next to the city of East Helena in the Helena valley. The Helena valley is a fairly wide valley (approximately 16 miles by 16 miles) and lies east of the Continental Divide. The valley is surrounded by mountains and, as with many areas in Montana, experiences inversions in the fall and winter months. East Helena is located at the southern end of the valley. Located east of the Continental Divide, the valley often sees down-slope winds which ventilate the valley fairly well. Predominant wind directions are from the northwest through southwest. Monitoring by ASARCO in the early 1970s revealed exceedances of the SO_2 standard in the East Helena area. At that time ASARCO operated six monitoring sites in the East Helena area.

In 1975, the Montana SIP was revised setting forth SO_2 controls that provided for the attainment and maintenance of the NAAQS. The strategy limited the emission rate for the sinter plant and called for a 75% reduction of SO_2 on an annual basis. As a result, ASARCO installed a double contact acid plant with several modified stacks to reduce the SO_2 emissions in 1977.

Continued monitoring by ASARCO showed attainment of the SO_2 NAAQS at all sites except the Kennedy Park site (north of East Helena). Nighttime drainage winds from the south along the Prickly Pear Creek often cause emissions to drift to the north. This was the probable cause of high concentrations at the Kennedy Park monitor. In 1977, the area was designated non-attainment for SO_2. It was determined that emissions from shorter stacks serving the smelter's blast furnace were the cause of the exceedances. In 1978 and again in 1980, field tracer studies were conducted to determine good engineering practice (GEP) stack height for a proposed taller stack. These proposed changes were submitted as part of the SIP. In 1982, a new blast furnace baghouse stack was built. The taller stack allowed emissions to be dispersed at a higher elevation and eliminated high concentrations near ground level.

From 1974-1982, the department operated three SO_2 sites adjacent to ASARCO's sites. After the acid plant was installed and the new blast furnace baghouse stack was built, ambient concentrations dropped dramatically and the state discontinued their sites, relying on ASARCO to provide SO_2 concentration data. In 1991 ASARCO operated six SO_2 monitoring stations in the East Helena area. They were as follows: Kennedy Park (30-049-0703), East Station (30-049-0711), Kleffner Road (30-049-0701), Water Tank (30-049-0702), Microwave Tower (30-043-0903), and Ash Grove Siding (30-043-0908).

Data from samplers in the immediate vicinity of the smelter have shown exceedances but no violations of the NAAQS or MAAQS. There were some "violations" of the three-hour NAAQS in 1987 at an SO_2 site about four miles from the smelter near a cement manufacturing facility. This was at the Highway 518 site (30-043-0906). A data review did not determine any cause for the high readings and it was difficult to determine if the readings were valid. No other violations have occurred since this time.

In April, 1991, EPA notified the department that the East Helena SO_2 SIP was inadequate and needed to be revised and submitted to EPA by May 1992. This request was driven by an inadequate GEP stack height analysis and requirements in the Clean Air Act Amendments of 1990. In 1991, the department received ASARCO's SO_2 data from 1986 through 1989 on magnetic media and updated it to AIRS. The data falls short of proper QA procedures such as weekly zero/span checks and quarterly audits. As a result, the department worked with ASARCO to develop a QA plan and SOP documents for their SO_2 monitoring network. This package was submitted to EPA in August, 1992 and approved by EPA on February 23, 1993.

In 1992, dispersion modeling was performed as part of the SIP revisions. The modeling indicated that potentially high ambient SO_2 levels were occurring in the elevated terrain to the southwest

and southeast of the smelter, in Jefferson County. As a result, the ambient SO_2 monitoring network was significantly revised in the spring of 1993. The current network consists of 13 SO_2 sites, as follows: Microwave (#30-043-0903), Ash Grove Siding (#30-043-0908), Kleffner Road (#30-049-0701), Water Tank (#30-049-0702), Kennedy Park (#30-049-0703), Top of Microwave Hill (#30-043-0909), McClellan Creek Road #3 (#30-043-0910), McClellan Creek Road #4 (#30-043-0911), McClellan Creek Road #5 (#30-043-0912), McClellan Creek Road #6 (#30-043-0913), McClellan Creek Road #7 (#30-043-0914), McClellan Creek Road #8 (#30-043-0915), McClellan Creek Road #9 (#30-043-0916). This expansion of the network necessitated the purchase of extra SO_2 analyzers and ASARCO opted to purchase analyzers other than their own model. As a result, they had to write additional SOP and QA manuals to cover the new equipment. Draft versions were submitted to EPA in the summer of 1993 and the manuals are currently being revised to reflect EPA comments. Final approval is expected in the fall of 1993.

The current network is adequately distributed to show attainment and maintenance of the NAAQS and MAAQS. Once the SIP is approved and the control measures implemented the SO_2 monitoring network will be reduced to only those sites necessary to adequately monitor the maximum SO_2 impact areas.

The department is currently working out details for a new East Helena SO_2 SIP with ASARCO. The final version is expected to be completed and submitted to EPA in November, 1993.

2.1.3 AQCR 143 - EASTERN MONTANA

2.1.3.1 ROSEBUD COUNTY

The sulfur dioxide issue in Rosebud County centers around Montana Power Company's four coal-fired power generating plants in Colstrip. Units #1 and #2 were permitted in 1973 by the state. Unit #1 was commissioned in October 1975 and Unit #2 in August 1976. The SO_2 control for these units are wet scrubbers with a 70% control efficiency. In 1992, all the Colstrip units emitted approximately 10,500 tons/year of SO_2.

In 1978, a PSD permit was issued by the EPA for Colstrip Units #3 and #4. EPA was the issuing agency because, at that time, the state had not been delegated PSD permitting authority. However, the state did issue a normal construction and operating permit. The issue of impact on the Northern Cheyenne PSD Class I area resulted in higher stacks and greater control efficiencies for Units #3 and #4. The control for these units consists of wet scrubbers with lime injection and results in a 90% control efficiency.

The company maintains an ambient network around the facility and supports a tribal air monitoring program on the Northern Cheyenne reservation. Data submitted by the company show very low concentrations with no violations of the NAAQS or MAAQS. MPC operates three SO_2 sites. These are at MPC #1 (30-087-0701), MPC #2 (30-087-0702), and MPC #3 (30-087-0700). MPC #4 (30-087-0704) was shut down on June 30, 1992 and the termination was approved in an EPA-letter dated April 3, 1992.

The topography of the area is semi-rugged to rolling terrain. The area sometimes experiences temperature inversions but generally receives good airflow and is usually well ventilated.

The Colstrip area is considered attainment for SO_2. The department is currently processing Montana Power's SO_2 data and updating it to AIRS. The department is also obtaining precision and accuracy data. It is still imperative to keep collecting ambient SO_2 data with the current network. The current network is adequately distributed to track compliance with the NAAQS, MAAQS, and PSD increments.

2.2 NITROGEN DIOXIDE AREAS

As mentioned in Section 1.2.6, nitrogen dioxide is not a pollutant of concern in Montana. There are, however, two areas in the state where NO_2 is being (or was recently) monitored by companies as a permit condition. These areas are in Missoula and Colstrip.

2.2.1 AQCR 143 - EASTERN MONTANA

2.2.1.1 ROSEBUD COUNTY

The nitrogen dioxide issue in Rosebud County centers around Montana Power Company's four coal-fired power generating plants in Colstrip. Units #1 and #2 were permitted in 1973 by the state. Unit #1 was commissioned in October 1975 and Unit #2 in August 1976. In 1978, a permit was issued by the EPA for Colstrip Units #3 and #4. EPA was the issuing agency because, at this time, the state had not been delegated PSD permitting authority. However, the state did issue a normal construction and operating permit. In 1992, the Colstrip units emitted approximately 42,380 tons/year of NO_2.

The company maintains an ambient network for NO_2 around the facility and supports a tribal air monitoring program on the Northern Cheyenne reservation. Data submitted by the company are very low and show no violations of the NAAQS or MAAQS. MPC operates three NO_2 sites. These are at MPC #1 (30-087-0701), MPC #2 (30-087-0702), and MPC #3 (30-087-0700). MPC #4 (30-087-0704)

was shut down on June 30, 1992 and the termination was approved in an EPA-letter dated April 3, 1992.

The topography of the area is semi-rugged to rolling terrain. The area sometimes experiences temperature inversions but generally receives good airflow and is usually well ventilated.

The Colstrip area is considered attainment for NO_2. The department has updated all of Montana Power's NO_2 data through the end of 1989 and will continue to update it to the present. The department is also obtaining precision and accuracy data. It is still imperative to keep collecting ambient NO_2 data with the current network. The current network is adequately distributed to track compliance with the NAAQS and MAAQS.

2.2.2 AQCR 144 - NORTHWESTERN MONTANA

2.2.2.1 MISSOULA COUNTY

Missoula is situated at the confluence of the Bitterroot and Clark Fork Rivers. The Missoula valley is fairly narrow but is the home to nearly 65,000 persons. The Missoula valley is similar to other western Montana valleys in that it is susceptible to temperature inversions in the fall and winter months. Wind speeds are generally calm (less than 10 mph) throughout the year.

The nitrogen dioxide issue in Missoula County centers around the Stone Container kraft pulp mill near Frenchtown. In May 1987, the company received a PSD permit from the state to burn petroleum coke in their four lime kilns. As a permit condition, Stone Container was required to operate one NO_2 monitoring site near their facility. To date, only one lime kiln has been converted to burn coke. The data collected and submitted to the state by Stone showed very low concentrations with no violations of the NAAQS or MAAQS. In 1992, the Stone Container facility emitted approximately 1,970 tons/year of NO_2.

The NO_2 monitoring was discontinued, at Stone's request, on June 1, 1992 due to low ambient concentrations. The monitoring will resume when another lime kiln is converted to burn coke. The ambient data showed that the area remains in compliance with the NAAQS and MAAQS.

2.3 CARBON MONOXIDE AREAS

Carbon monoxide (CO) is a pollutant of concern in the larger communities in Montana. Currently, there are three CO non-attainment areas in Montana; they are Missoula, Great Falls and Billings. Automobile exhaust is the principal source of CO emissions in these communities. Other sources include industrial emissions as well as agricultural and forestry burning. In some

western Montana valleys, residential wood combustion is a major contributing source.

As part of the network review process, the department looked at other communities where CO may be a problem. These are discussed in the following sections.

2.3.1 AQCR 140 - SOUTH CENTRAL MONTANA

2.3.1.1 YELLOWSTONE COUNTY

In Yellowstone County, the city of Billings is situated along the Yellowstone River valley. The Yellowstone River valley runs from southwest to northeast and is a predominant topographical influence on the airflow in the area. Located both to the north and south of the river are cliffs or rimrocks which tend to cause channeling. The distance between rims is about one mile wide where the downtown area is located.

The Billings downtown area was designated non-attainment for CO due to high readings at the 27th & Montana monitoring site (30-111-0053). Automobile exhaust was thought to be the principal source of CO. As part of the SIP development process, a model predicted that an area along Main Street (formerly Exposition Drive) had the highest potential to exceed the standards. The plan for the attainment of the 8-hour standard predicted that modification to the Main Street-First Avenue North intersection would achieve the standard.

Data collected at the Metra Parking Lot site (30-111-0061) during the two years following the modifications to Main Street (1985-86) indicated compliance with the standard. Upon EPA's review of the redesignation request, the department was informed that (1) the data collected did not meet the completeness requirement, (2) the site should be relocated nearer the road at a maximum concentration microscale site, and (3) a redesignation request would have to show attainment/maintenance at all locations.

Attempts to locate a new EPA-approved site followed a somewhat convoluted path. EPA wanted a site just north of the 4th Avenue entrance to the Metra Parking Lot. Permission could not be obtained mostly due to traffic and safety concerns. A site was temporarily located near the Main Street-6th Avenue North intersection (30-111-0074), but soon after it started operation, water pipes and valves were unearthed below the monitoring shelter. It was decided that this site was impractical considering future access to the same water valves.

After a lengthy approval process, EPA granted permission to locate a microscale CO monitor just south of the 4th Avenue North entrance to the Metra Parking Lot (30-111-0075). CO data at this

site has been collected since October 1988 and did not record any exceedances of the MAAQS or NAAQS.

In order to show attainment and maintenance of the standard at all locations, Yellowstone County Air Pollution Control conducted CO grab sampling studies during the winters of 1988-89 and 1989-90, and a CO saturation study in December of 1991. The last study identified two maximum CO concentration areas; the rapidly growing west side along 24th Street West and the downtown business district along North 27th Street. As a result of the EPA-approved saturation study the department and the Yellowstone County Air Pollution Control program installed two new CO monitoring sites in Billings during the fall of 1992 and terminated the Metra CO monitoring site (30-111-0075).

The downtown site, Diamond Parking (30-111-0078), is located on North 27th Street, between 3rd & 4th Avenues. It began operation in November of 1992 and was approved by EPA in a letter dated April 2, 1993. The westside site, Mount Olive (30-111-0079), is located on 24th Street West, just north of Central Avenue. It also began operation in November of 1992 and it was approved by EPA in a letter dated February 5, 1993. Since the area is currently non-attainment for CO and an attainment demonstration still needs to be made, the monitors will be kept at their current locations. An attempt will be made to collect 8 consecutive quarters of data at the two sites.

Due to provisions in the Clean Air Act Amendments of 1990, Billings was categorized as "interim" or "transitional" under the CAAA. This label was given because the design value for this community was less than 9 ppm. The state is required to submit community-specific maintenance plans to EPA when the redesignation request is made. At that time the department will review the data to determine which site records the maximum CO concentrations and only operate that one site for maintenance purposes.

2.3.2 AQCR 141 - CENTRAL MONTANA

2.3.2.1 CASCADE COUNTY

In Great Falls, a corridor along 10th Avenue South was designated non-attainment for CO in September, 1980 due to high readings at the Midas Muffler site (10th Ave. South and 9th Street)(30-013-0015). This particular site ran from 1977 until 1979 when a leasing problem forced the state to relocate the monitor about twelve blocks east at the Great Falls Federal site (30-013-0021). This site operated until 1983 when the monitoring trailer was again moved to the Pardis Clinic (30-013-1023) site. The Pardis site was located one block west and across the street from the original Midas Muffler site. The department anticipated higher concentrations at this site because it was located at a

lower elevation and the traffic volume on 10th Avenue South was higher.

Sampling at the Pardis Clinic site began in November, 1983 and was established as a middle scale site. In May, 1987 and again in August, 1987, EPA informed the state that "in order to determine whether an area is attaining the NAAQS, a control agency must locate at least one monitoring station in the area of maximum concentration." EPA interprets such a location for CO to be a microscale site. On November 4, 1987, the department moved the probe to be within microscale siting. The site remained microscale until November 16, 1988 when the site was moved back to middle scale at the landowner's request.

CO data collected at the Pardis Clinic site showed a few exceedances of the 8-hour standard from 1986-88. A review of the exceedances showed that most occurred in the evening hours with very light to calm winds. A staff review of data performed in 1983 showed that area-wide sources could be contributing to the elevated readings.

Since microscale siting at the Pardis Clinic could not be continued, the department located the CO trailer about a block west on 10th Avenue South at the Skyway Conoco site (30-013-1025) on November 9, 1989. This site modification request was approved by EPA in a letter dated November 2, 1989. This site is currently in operation and is microscale.

The department and Cascade County conducted a saturation study in January, 1992 in an attempt to determine a maximum concentration CO site in Great Falls. The results from this study were generally inconclusive. There was one location a few blocks east of the existing Skyway Conoco site that had slightly higher CO concentrations. However, most of the concentrations recorded during the study were low due to windy conditions that resulted in excellent atmospheric ventilation. The dispersion conditions during the study are typical of those present in Great Falls most of the year. Attempts by Cascade County personnel to obtain permission to relocate the CO site a few blocks to the east on 10th Avenue South failed. The department is not concerned about this failure because the differences in the CO concentrations measured during the saturation study were statistically insignificant. As a result the department is convinced that the Skyway Conoco site is located in the area of maximum CO concentrations and there are no plans to relocate the site or establish a second one.

Automobile exhaust was originally thought to be the principal source of CO in Great Falls. As part of the SIP development process, a model predicted that several intersections along 10th Avenue South could have the potential for violating the NAAQS for CO. In the plan submitted to EPA, CO standards could probably be

achieved by 1985 or 1986 with EPA-mandated emission standards for automobiles, increased traffic speed along 10th Avenue South, improved traffic light synchronization, a widening of a bridge, a mass transit system and reductions at the Montana Refining Company.

Due to the continued noncompliance at the monitoring sites on 10th Avenue South, EPA told the state that the SIP is inadequate and will need to be redone. As part of this rewrite, CO emission inventory data was submitted to EPA in December, 1989. The department never received comments from EPA on the adequacy of this emission inventory. A new emission inventory using 1990 as a base year was submitted to EPA in the summer of 1992; EPA's comments on this inventory were received in December, 1992. The department expects to submit the finalized inventory to EPA in December, 1993.

Due to provisions in the Clean Air Act Amendments of 1990, Great Falls was categorized as "interim" or "transitional" under the CAAA. This label was given because the design value for this community was less than 9 ppm. The state is required to submit community-specific maintenance plans to EPA at the time of the redesignation request. EPA mandated tailpipe controls are expected to bring attainment by 1995. A 3% decrease in population since 1980 should assist in the attainment.

2.3.3 AQCR 142 - SOUTHWESTERN MONTANA

2.3.3.1 SILVER BOW COUNTY

Butte, located in Silver Bow County, was suggested by staff as a possible location for a carbon monoxide monitoring site. The area is currently attainment or unclassified for CO. In 1987-88 an SPM site for CO was operated on Continental Drive (30-093-0022) near the main entrance to the Berkeley Pit and within a few blocks of the department's PM-10 site at Greeley School (30-093-0005). The highest 8-hour reading was 9.1 ppm. In 1978-79, the department operated a site at Hebgen Park (30-093-0018). The highest 8-hour concentration was 7.8 ppm. Neither site would be considered a maximum concentration site for CO.

Butte has a population of approximately 34,000 persons. The elevation averages 5300 feet with the Continental Divide surrounding the city on three sides. Wind speeds in Butte are usually calm and the area is susceptible to severe temperature inversions in the fall and winter. The old part of Butte is built on a hillside next to the Berkeley Pit. The new part of town is built on the "flats" to the south and is where much of the strip development is located. Harrison Avenue is a street that links uptown with the flats. Interstate 90 is a major east/west highway that slices through the lower part of town with off-ramps to Harrison Avenue.

The department proposes establishing a CO site near the Harrison Avenue-Interstate 90 intersection. Exact siting would involve an on-site inspection of the area, review of traffic counts and a CO saturation study. Appropriate network modification forms will be filled out and submitted to the EPA for approval. The establishment of this site depends upon resources, equipment availability and the results of the CO saturation study.

2.3.4 AQCR 144 - NORTHWESTERN MONTANA

2.3.4.1 FLATHEAD COUNTY

Kalispell, in Flathead County, was suggested by staff as a possible location for a carbon monoxide monitoring site. The area is currently attainment or unclassified for CO. There has been no previous CO monitoring in Kalispell.

Kalispell has a population of approximately 12,000 persons although the majority of the 59,000 county residents live within a 15 mile radius of the city. Kalispell serves as a business, service and shopping center for the greater Flathead valley. The Flathead valley is located west of the continental divide and is a fairly wide (14 miles across) valley. The climate is mild with calm or low wind speeds. Like many communities in the western part of the state, the area is susceptible to temperature inversions in the fall and winter. Two major highways serve Kalispell. These are Highway 2 which is an east/west route and Highway 93 which is a north/south route. These two highways meet at a stoplight in Kalispell at Main Street (Highway 93) and Idaho Avenue (Highway 2). The queuing time for this intersection can be quite lengthy, allowing motor vehicles to idle for extended periods, emitting large quantities of CO.

Residential wood combustion in Kalispell is common as much of the community has fairly easy access to wood from local forests. The CO emitted by traffic at the Main Street-Idaho Avenue intersection combined with the area-wide contribution from wood stoves has the potential to create elevated concentrations of CO.

The department proposes to establish a CO site near the Main Street-Idaho Avenue intersection. Exact siting would involve an on-site inspection of the area, review of traffic counts and a CO saturation study. Appropriate network modification forms will be filled out and submitted to the EPA for approval. The establishment of this site depends upon resources, equipment availability and the results of the CO saturation study.

2.3.4.2 MISSOULA COUNTY

The entire city of Missoula was designated non-attainment for CO based on high concentrations recorded at the intersection of

Brooks (U.S. 93), Russell and South. This intersection and the monitoring site are known as Malfunction Junction (30-063-0005). Exceedances of the 8-hour CO standard have also been observed at other air monitoring sites in Missoula: Lions Park (30-063-0019), Higgins Avenue (downtown area) (30-063-0023) and Boyd Park (30-063-0024).

Missoula is situated at the confluence of the Bitterroot and Clark Fork Rivers in western Montana. The city has a population of approximately 45,000 persons but the urban area contains approximately 65,000. The Missoula valley is fairly narrow (approximately 6 miles across) and similar to other western Montana valleys in that it is very susceptible to temperature inversions in the fall and winter months. Wind speeds are calm or low throughout the year and allow concentrations to build up.

A SIP was submitted to EPA which detailed a plan to bring the area into compliance. The plan called for the reconstruction of the Malfunction Junction intersection including limited turn lanes, timing sequences for the traffic lights and increased vehicle speeds. Additional reconstruction was performed on a portion of Highway 93 between Mount Avenue and Reserve Street. The reconstruction was completed in late 1985.

The Malfunction Junction site was temporarily shut down in July, 1983 and reactivated in January, 1986 after the completion of the reconstruction. The CO data collected since 1986 is lower but still shows some exceedances of the 8-hour CO standard.

A second CO site in Missoula has operated at Boyd Park in the southern part of the city since 1981. It is suspected that most emissions at this site are from residential wood combustion, although CO from traffic may also be a contributing factor. In May 1991, the department made a request to EPA to permanently shut down the site. The site had not measured an 8-hour CO exceedance since 1987 and the site was in the same general area as the maximum concentration site of Malfunction Junction.

EPA responded to the department's request in a letter dated August 8, 1991. They disapproved of the proposal to permanently shut down the Boyd Park CO site. They needed additional justification (documentation) that Malfunction Junction is the maximum CO location and that there is no need for a second CO monitoring site in Missoula (i.e., that Malfunction Junction can adequately address all contributing sources to the CO problem in Missoula, whether they are mobile, point or area sources). The department provided EPA with additional justification in a letter dated September 16, 1991. EPA then agreed to the Boyd Park shut down request in a letter dated October 4, 1991. The Boyd Park CO analyzer was never re-started since it had been shut down for the summer season on April 1, 1991.

During December, 1992 the department and Missoula County conducted a CO saturation study in Missoula. The final report was submitted to EPA on April 20, 1993. EPA's response, in a letter dated May 24, 1993 states, "We agree, the study confirms the Malfunction Junction intersection has the highest carbon monoxide levels in the Missoula area and the existing monitoring station know as "Malfunction Junction" is the maximum concentration monitoring station."

EPA and the department are concerned that area-wide sources such as residential wood combustion combined with traffic emissions contribute to elevated CO levels at other areas in Missoula. In July, 1988, EPA notified the department that the Missoula CO SIP was substantially inadequate. The department and Missoula County prepared a new emission inventory and submitted it to EPA in December 1989. The department never received comments from EPA on the adequacy of this emission inventory. A new emission inventory using 1990 as a base year was submitted to EPA in the summer of 1992; EPA's comments on this inventory were received in December, 1992. The department expects to submit the finalized inventory to EPA in December, 1993. Additional controls for CO in Missoula were gained by implementing an oxygenated fuels program on October 1, 1992.

Due to provisions in the Clean Air Act Amendments of 1990, Missoula was categorized as a "moderate" non-attainment area. This label was given because the design value was between 9.5 ppm and 12.5 ppm for an eight hour period. The state submitted a SIP revision, consisting of the oxy-fuels program, to EPA on November 6, 1992. The department is waiting for EPA's approval of the revised Missoula CO SIP. The department has no plans for a second CO monitoring site in Missoula and intends to operate only the Malfunction Junction site for maintenance purposes.

2.4 OZONE AREAS

Ozone (O_3) is not a pollutant of concern in Montana. All areas of the state are considered attainment for ozone. Unlike most other pollutants, O_3 is generally not emitted directly into the atmosphere but results from a complex photochemical reaction between volatile organic compounds (VOC), oxides of nitrogen (NOx), and solar radiation. Both VOC and NOx are emitted directly into the atmosphere from sources within the state. Since solar radiation is a major factor in O_3 production, O_3 concentrations peak in the summer months.

2.4.1 AQCR 140 - SOUTH CENTRAL MONTANA

2.4.1.1 YELLOWSTONE COUNTY

The department conducted O_3 monitoring in Billings in 1988 and 1989 at the Scottish Rites monitoring site (30-111-0073) in the city center. Billings is in an area where sources emit fairly large quantities of VOC and NOx. Billings is also an area where hot summer days may promote photochemical reactions. EPA defines the O_3 monitoring season for Montana as June 1 to September 30. Ozone data collected at the Scottish Rites site showed higher concentrations in the summer months but no exceedance of the NAAQS were recorded.

The Scottish Rites site (which also monitored for SO_2) was discontinued in September 1989 and moved to another location. Since the O_3 readings were low and resources were needed for other purposes, the department discontinued O_3 monitoring.

2.5 LEAD AREAS

2.5.1 AQCR 142 - SOUTHWESTERN MONTANA

2.5.1.1 LEWIS & CLARK COUNTY

As already mentioned, lead is a pollutant of concern in East Helena where the predominant source is the ASARCO primary lead smelter. After promulgation of ambient air quality standards for lead, the East Helena area violated the lead standard based on ambient monitoring. The department then conducted extensive source apportionment studies in the early 1980's. These studies included the chemical mass balance technique and the results indicated that re-entrained road dust and soil, fugitive ore concentrates, zinc oxide material and blast furnace upsets were the primary lead sources.

A SIP was developed and approved by EPA in 1984 which contained control strategies designed to bring the area into compliance. As of December 31, 1986, all the control strategies in the plan were implemented but ambient air monitoring data for 1987 and 1988 indicated that although lead levels decreased, they still remained above the standard. As a result, EPA notified Montana on October 1, 1988 that the East Helena lead SIP was inadequate. During the last half of 1990 and the first half of 1991, the state and the involved companies conducted ambient monitoring, emission inventory estimations, source apportionment studies, meteorological data collection, and dispersion modeling in support of a new SIP.

In a letter to EPA dated May 31, 1991 the department proposed several modifications to the East Helena TSP/Pb network. The department proposed shutting down the Hadfield, Dartman Field, and Microwave sites at the end of June, 1991. The department intended to keep the Firehall and Old Railroad sites but reduce the sampling

frequency to every other day. The department felt that a smaller network with samplers at the maximum concentration sites would provide adequate coverage in the East Helena area. EPA responded in a letter dated August 14, 1991 in which they agreed to allow the shut down Microwave but wanted the department to continue operation of the other sites. Microwave was officially shut down on June 30, 1991.

The current monitoring network consists of the following four sites: Hadfield (30-049-0719), Firehall (30-049-0714), Dartman Field (30-049-0724), and Old Railroad (30-049-0726). From July 1, 1990 until March 31, 1991, these sites (except for Hadfield) operated on an every day sampling schedule. Currently, all sites run at a 1-in-6 schedule (Hadfield runs collocated 1-in-6) except Firehall, which runs on a 1-in-2 schedule.

In conjunction with the ambient monitoring, ASARCO collected extensive meteorological data at four sites. Three of the met sites included lead/TSP monitors. The company is also doing extensive emission inventory work to determine daily emission estimates from the various sources. The emission data has been combined with the meteorological data to run a dispersion model to determine concentrations downwind of the facility. Receptor modeling (CMB) was performed and the CMB results were compared with the dispersion modeling. At present, an effort is being made to reconcile differences between the two models. Final control strategies will be determined based on the analysis of this data and consultation with the company and EPA. When the maximum concentration site is identified, the department proposes to shut down the Hadfield TSP/Pb site and install a new site at the high concentration spot. The revised SIP for East Helena is scheduled to be submitted to the EPA for approval by April 1, 1994.

2.6 PARTICULATE (PM-10 AND TSP) AREAS

As mentioned in Section 1.2.1, particulate matter is the largest air pollution problem in the state and has historically received the highest priority from the department. In some portions of the state, there is a total suspended particulate (TSP) record dating back to 1970. From this long historical data base the department has learned many of the significant factors that contribute to particulate pollution in Montana. It is clear that the most important factor is a combination of meteorology and topography. Mountain valleys and frequent temperature inversions often lead to particulates being trapped close to their emission source for days at a time. The ensuing particulate matter build-up has caused many communities with relatively small particulate emission rates to exceed federal particulate standards.

In the 1970s and 80s, a statewide TSP network was run by the department. Data from this network proved that very few areas in

the eastern portion of the state had concentrations close to primary or secondary TSP standards. Consequently, the majority of the department's present particulate monitoring is conducted in the state's mountainous western region.

Particulate monitoring has now evolved into sampling for PM-10 because of promulgation of the 1987 ambient air quality standard. PM-10 particles have an aerodynamic diameter less than 10 microns and are a subset of TSP pollution. This change forced a considerable downsizing of Montana's particulate sampling network. The new standard required every day sampling in non-attainment areas, as opposed to every sixth day TSP sampling. This increased the number of filters for the department's staff to analyze, and also necessitated locating more than one sampler per site. Because of a limited supply of samplers, the department staff had to prioritize areas at which monitoring would continue.

PM-10 monitoring began in the summer of 1985 at many of the current sites. The inlets initially used had a "bounce off" problem where large particles were allowed through the inlet thereby biasing some PM-10 concentrations higher. To remedy the problem, all inlets in the network were retrofit with a factory-supplied, greased impaction shim during the summer of 1987.

Particulate emission sources in Montana are diverse. Point sources typically can be placed into one of the following categories: coal and ore mining, non-metallic mineral processing (i.e., talc, lime, and phosphate mines), wood products industries, slash burning, and wood and coal fired power generation. Although some of these sources are significant (see Appendix A), they are typically located in relatively remote areas where the threat to public health is minimal. Of greater concern in the state are area and mobile sources. Examples of area sources include re-entrained road dust and residential wood combustion. Mobile sources generally include tailpipe emissions and re-entrained road dust. These sources in combination with localized point sources are the cause for most of the PM-10 problems in Montana.

The following subsections present brief descriptions of the particulate monitoring sites which have been operated or overseen by the department. Included in the descriptions are summaries of the sources that have impacted the areas, relevant topographic and meteorological information, discussions of the data collected, and future recommendations for the sites.

2.6.1 AQCR 140 - SOUTH CENTRAL MONTANA

2.6.1.1 YELLOWSTONE COUNTY

Yellowstone County is located in south central Montana and is bisected by the Yellowstone River. The major cities in the County

are Billings (population approx. 81,000) and Laurel (population approx. 5,600) which are located along the Yellowstone valley floor. On the north and south edges of the valley, the rimrocks rise abruptly above the valley floor. The valley is approximately 12 miles wide in Laurel but on the eastern edge of Billings, the rimrocks form a constriction that is only about one mile wide. The prevailing winds are from the southwest and are channeled down the valley. The winds are usually responsible for good dispersion but occasional temperature inversions do occur.

Particulate monitoring has been conducted in Yellowstone County since 1971. Initial sampling used the standard hi-vol samplers for TSP and although there have been several TSP sites in Yellowstone County, only those in the central part of Billings showed elevated concentrations. After passage of the 1977 Clean Air Act Amendments, a portion of downtown Billings was designated non-attainment for the secondary TSP standard. Emission inventories and modeling showed that road dust from paved roads was the major contributor to TSP. The SIP called for an extensive street sweeping and flushing program to bring the area into compliance.

After promulgation of the new PM-10 standards the EPA used PM-10 to TSP ratios and statistics to determine if areas had a probability of exceeding the PM-10 standards. Billings and Laurel were designated Group III (having less than a 20% chance of exceeding the standards). Because of the probability statistics, the department made a request to EPA to have the secondary TSP non-attainment area redesignated to unclassified. The EPA asked that the state withdraw the request and pushed for additional PM-10 monitoring. The department then requested that the EPA rerun the probability calculations and make a second determination but the EPA did not follow up on this request.

In 1986, PM-10 monitoring was started at the Grand Avenue School site (30-111-0072) in Billings. After this site was terminated, the sampler was moved to the Scottish Rites site (30-111-0073). The PM-10 data showed no exceedances of the standards.

In November, 1989 the Yellowstone County Air Pollution Control (YCAPC) agency started operation of a microscale PM-10 sampler on the Billings Federal Credit Union (30-111-0077) on 4th Avenue North to determine compliance with the PM-10 standard at a maximum concentration site. Information from this site was used as part of an attainment redesignation request. Through the end of 1991, this site operated on a 1-in-6 schedule with a collocated sampler. Also, the YCAPC analyzed their own filters until it was determined the laboratory facilities were inadequate. Beginning January 1, 1992 the department took over the filter processing responsibilities. As a result, the department became the reporting agency and collocated monitoring was no longer required. With the

elimination of collocated sampling the YCAPC changed to samplers operating on a 1-in-3 schedule.

Because of security reasons, the Federal Credit Union site was terminated on August 4, 1992 and moved one city block directly west to the new site at Diamond Parking (30-111-0078) where sampling began on November 2, 1992. Network documentation forms have been sent to and approved by the EPA. The site is currently operated on a 1-in-3 day schedule. Similar to the Federal Credit Union, PM-10 levels have thus far been low.

2.6.2 AQCR 141 - NORTH CENTRAL MONTANA

2.6.2.1 CASCADE COUNTY

Cascade County is located in central Montana and at the southern end of AQCR 141. Great Falls is Montana's second largest city with a population of 55,000 and is located at the confluence of the Missouri and Sun Rivers. The municipal airport and National Weather Service office are located on a plateau between the Missouri and Sun River Junction. This plateau is about 200 feet higher than most of the immediate valley area, and the airport is about two miles southwest of the Sun and Missouri River Junction. Except to the north and northeast, the valley is encircled by mountain ranges which lie about 30 miles away from east to south, 40 miles to the southwest, and 60 to 100 miles distance from west to northwest. Topography plays an important part in the climate of Great Falls. The Continental Divide to the west, and the Big Belt and Little Belt Ranges to the south are primary factors in producing the frequent wintertime chinook winds observed in this part of Montana. The combination of valleys and plateaus in the immediate area contributes to marked temperature differences between the airport and Great Falls proper. This occurs either on calm clear mornings or when chinook winds reach the airport before they are felt at the lower elevations in town. The prevalence of chinook winds creates a relatively high average wind speed which promotes good ventilation in the community most of the time.

Particulate monitoring has been conducted in Cascade County since 1971. Initial sampling used standard hi-vol TSP samplers. There have been several TSP sites in Cascade County but only those in the central part of Great Falls and Black Eagle had elevated concentrations. After the passage of the 1977 Clean Air Act Amendments, a portion of downtown Great Falls was designated non-attainment for the secondary TSP standard. Emission inventories and modeling showed that road dust from paved roads was the major contributor to TSP. The SIP called for an extensive street sweeping and flushing program to bring the area into compliance.

The Cascade County Health Department (CCHD) ran two TSP sites in 1990: one at the Downtown site (30-013-0017) and the other at

the Sunnyside School (30-013-1024). The Sunnyside School site had siting problems and because concentrations were low, the department and CCHD shut down this site on 4-5-90. And since there was no longer a TSP standard, the Downtown TSP site was also terminated on 7-2-90.

After promulgation of the new PM-10 standards, the EPA used PM-10 to TSP ratios to statistically determine if areas had a probability of exceeding the PM-10 standards. Great Falls was designated Group III (having less than a 20% chance of exceeding the standards).

In 1985, PM-10 monitoring started at the Downtown site (30-013-0017) in Great Falls and the site continued until 1988. In February 1988, there was an exceptional event (dust storm) which caused very high TSP readings, especially at the Fire Station #1 site (30-013-0009). The department reviewed the TSP and PM-10 data and determined that the Fire Station #1 site was the maximum concentration site for Great Falls. A request was made, and approved by the EPA, to allow the department to move the PM-10 sampler to the Fire Station. The samplers were run collocated on a 1-in-6 schedule until the the department assumed responsibility for the samplers on October 1, 1991. The sampling frequency was then increased to 1-in-3 (without collocation). PM-10 concentrations to date have been consistently low.

2.6.3 AQCR 142 - SOUTHWESTERN MONTANA

2.6.3.1 BEAVERHEAD COUNTY

The principal air quality concern in Beaverhead County centers around industrial activity six miles south of the town of Dillon. Dillon is located near the center of the Beaverhead valley. The valley floor is about 5400 feet in elevation with relatively low (6700 feet) rolling mountains located ten miles to the west. Although higher mountain ranges such as the Pioneer, Snow Crest and Ruby are nearby, the Dillon area is open. The industrial sources south of Dillon include the Pfizer talc plant, the Stoltze sawmill (shutdown June 1990) and an agriculture fertilizer supplier.

In September 1984, a monitoring site for TSP was established at the Beaverhead County Courthouse (30-001-0001). This site operated for two years until June 1986. The monitoring data showed relatively low readings and continued monitoring was not warranted.

Complaint investigations and inspections by department personnel have indicated that there might be air quality concerns around the industrial area south of Dillon. Depending on resources and equipment availability, the department may install a PM-10 sampler in the vicinity of the previously mentioned industries.

2.6.3.2 DEER LODGE COUNTY

The principal air pollution concern in Deer Lodge County centers around the city of Anaconda. Anaconda has a population of approximately 10,000 and lies at the southern end of the Deer Lodge valley. Anaconda was the home of a large copper smelter which operated for nearly 100 years. The smelter closed in 1980 and has since been put on the Superfund National Priority List.

Since the shutdown, the smelter buildings have been demolished and considerable reclamation has occurred. The Arco Coal Company now owns the property and is responsible for clean up.

The department monitored for particulates at several locations since the early 1970s while the smelter was still operating. Two of the primary sites were at Lincoln School (30-023-0007) and Highway Junction (30-023-0004). The Highway Junction site was primarily an SO_2 monitoring station where the department located a TSP monitor to address possible tailings dust. The Lincoln School site was established during the Montana Air Pollution Study (MAPS) to address health effects versus air pollution levels. Although the smelter shut down in 1980, public concern kept these sites active for a few years. The Lincoln School site was shut down in 1985 because Arco operated a duplicate sampler at this location. The Highway Junction sampler operated until 1987 when it was shut down because department resources were reallocated due to the new PM-10 standard.

Shortly after the EPA promulgated the new PM-10 standards on July 31, 1987, Anaconda was designated a Group II area, or a probability of between 20-95% of exceeding the PM-10 standards. A Group II designation requires every other day sampling.

The department did not concur with this designation and tried to get it reassigned to Group III, but the EPA stood by its decision. In the meantime, EPA Superfund staff were working with the ARCO Coal Company to develop a multi-disciplinary monitoring plan for proposed clean-up activities. The department provided input to the plan and ARCO agreed to start PM-10 monitoring in the Anaconda area.

Most recently the network consisted of four PM-10 sites as follows: Teressa Ann Terrace (30-023-0010), Mill Creek (30-023-0706), Kortum Storage (30-023-0714) and Zinc Storage (30-023-0011). Over nearly a three year period, all four monitoring sites recorded very low PM-10 levels and the sites were discontinued at the end of September, 1992.

2.6.3.3 GALLATIN COUNTY

The area of concern in Gallatin County centers around the cities of Bozeman and Belgrade. Bozeman (population 23,000) lies at the eastern edge of the Gallatin valley and is home to Montana State University. Bozeman does not have any major air pollution sources but does have problems with traditional area-wide sources such as emissions from paved and unpaved roads and residential wood combustion. Belgrade, with a population of 2,400 lies approximately nine miles west of Bozeman. Belgrade has one major air pollution point source--Lousiana Pacific's sawmill. Belgrade's main particulate emission sources include paved and unpaved roads, residential wood combustion and the sawmill.

Like many areas in the western part of the state, the Gallatin valley experiences temperature inversions in the fall and winter months. The dimensions of the Gallatin valley are approximately 12 by 20 miles. This large area allows pollutants to disperse with moderate to fast wind speeds. However, during calm inversion conditions, pollutants can build up and cause problems around the urban areas.

The department has been monitoring for particulates in Bozeman since 1978. The primary site has been at the East Main City Building (30-031-0002). Other locations were also monitored for TSP; they include Whittier School (30-031-0005) and Christie Fields (30-031-0007). The East Main site has proven to be the worst-case site in Bozeman. In 1985, the department installed a PM-10 monitor at this site. In 1987, when the PM-10 standard was promulgated, the department discontinued TSP monitoring at the East Main site and Christie Fields. In 1987, the EPA also designated Bozeman as a Group III area (having less than a 20% chance of exceeding the PM-10 standard).

Due to the high TSP readings measured by the city and the need to obtain additional data in this fairly large Montana city, the department installed a second PM-10 sampler at the East Main site on January 11, 1991. This increased the sampling frequency from 1-in-6 days to 1-in-2 during the first and fourth quarters. Network documentation forms have been approved by the EPA.

In Belgrade, the department received numerous complaints and a petition signed by approximately 300 persons to "monitor and do something about air quality in Belgrade." Although the community is small, it has experienced some urban sprawl from nearby Bozeman and has a major sawmill whose emissions include a wood-fired boiler and dust from the log deck. However, the main concern voiced by the citizens centered on dust from paved and unpaved roads. In response to the complaints, the department installed two PM-10 samplers in a central location in an open field behind a grain elevator and sampling began in October, 1991. The site operates 1-

in-2 schedule during the 1st and 4th quarters and 1-in-6 during the 2nd and 3rd quarters. Since sampling began readings have mostly been low, with an occasional high reading; the highest being 133 ug/m^3 on 1-3-92. Network documentation forms have been approved by the EPA.

2.6.3.4 JEFFERSON COUNTY

Particulate concerns in Jefferson County center around area sources in the northern part of the county. This part of the county serves as a bedroom community for persons living near and commuting to Helena. The northern part of Jefferson County includes the unincorporated communities of Montana City and Clancy as well as several adjacent subdivisions. These communities are located along the Prickley Pear Creek drainage with the Continental Divide range to the west and the Elkhorn Mountains to the east. Drainage winds tend to funnel the airflow on a north-south axis although the area does experiences calm winds and temperature inversions.

The residents of the area are linked to Interstate 15 by several paved and unpaved roads. Some of the paved roads are in relatively poor condition. Additionally, many residents use wood stoves or fireplaces as a heat source during the winter months. These area sources have the potential to cause elevated particulate concentrations. Depending on resources and equipment availability, the department may install a PM-10 sampler in the Clancy/Montana City area.

2.6.3.5 LEWIS & CLARK COUNTY

Particulate problems in Lewis & Clark County center around the city of Helena (population 25,000) and the town of East Helena (population 1,500). These two communities are situated near the southern end of the Helena valley. The valley is large (approximately 16 miles by 16 miles), lies east of the Continental Divide, and is surrounded by mountains on all sides. Wintertime dispersion conditions are generally favorable due to the fact that the city often gets chinook winds. These winds usually keep inversions from setting in for long periods of time. However, nighttime inversions and inversions lasting for a few days are common. Predominant wind direction is from the northwest through southwest.

Particulate monitoring has been conducted in Lewis & Clark County since 1970. Initial sampling was performed using standard hi-vol samplers for TSP. The mainstay of the particulate monitoring network in Helena has been at the Cogswell Building (30-049-0001) near the state capitol building. There have been several other sites in Helena, some of which were associated with Lewis & Clark County's wood stove curtailment program. PM-10 sampling

began in Helena in 1985 when the Cogswell TSP was converted to PM-10. Starting in 1991, the department added Lewis & Clark County Health Department's PM-10 site to its list of SLAMS reporting stations. This site is at the Lincoln School (30-049-0018) in Helena and is near commercial areas and traffic corridors. Concentrations at this site have been consistently low.

A considerable amount of particulate sampling has also been conducted in the East Helena area. Most of this particulate sampling has been conducted in connection with lead analyses around ASARCO's primary lead smelter. In 1978, East Helena was designated as non-attainment for the secondary TSP standard. No special control strategy was implemented since the emission inventory demonstrated over 50% of the particulate emissions were from nearby highway construction. In addition, ASARCO agreed to reduce TSP emissions from slag piles by spraying the piles with water or dust suppressants. The TSP data collected in East Helena since 1981 has shown compliance with the primary TSP standard but there were still some exceedances of the secondary standard.

In November 1989, two additional TSP/Pb samplers were installed in the East Helena area. These were the Old Railroad and Microwave (in Jefferson County) sites.

Because of the newly implemented PM-10 standards, two SA1200 PM-10 samplers were installed next to the existing TSP samplers at the East Helena Hadfield Site (30-049-0719). These were installed to provide comparison between the newly promulgated PM-10 standard and TSP, and to compare TSP Pb and PM-10 Pb. Data collection began on 7-1-88.

Three years of sampling showed that PM-10 Pb concentrations were consistantly lower than TSP Pb concentrations. Because of this relationship and the fact that the Pb NAAQS is based on TSP, the department felt that discontinuation of PM-10 Pb monitoring was warranted. A 5-31-91 letter to the EPA requested discontinuation of PM-10 Pb monitoring, the request was approved in a 8-14-91 letter, and PM-10 Pb monitoring was discontinued on 8-10-91.

The Hadfield site PM-10 concentrations over the three year sampling period were low with the highest annual arithmetic mean being only 38 ug/m^3. A request to discontinue PM-10 sampling in East Helena was submitted to the EPA in a 2-10-93 letter. The request was approved and PM-10 sampling was discontinued on 4-1-93.

From July 1, 1990 until March 31, 1991, the East Helena sites (except Hadfield) operated on an every day sampling schedule in support of data collection for the lead SIP. Since most of that effort has been completed, the department proposed shutting down three of the TSP/Pb sites in East Helena. This request was made in a letter to EPA dated May 31, 1991. EPA responded in a letter

dated August 14, 1991 agreeing to allow the termination of Microwave but wanted the department to continue the other sites. They also wanted to activate another TSP/Pb site in the area of the old Hastie site (30-049-0002). An SIP provision required the state to run lead (and TSP) sites at Hadfield, Dartman Field, Firehall and Hastie, but Hastie had been shut down in 1985 due to siting difficulties. The department responded in a letter dated September 9, 1991 and wanted to review modeling before establishing another site in the Hastie area.

The current monitoring network consists of the following four sites: Hadfield (30-049-0719), Firehall (30-049-0714), Dartman Field (30-049-0724), and Old Railroad (30-049-0726). From July 1, 1990 until March 31, 1991, these sites (except Hadfield) operated on an every day sampling schedule. Currently, Firehall runs on a 1-in-2 schedule. The other three sites run at a 1-in-6 schedule (Hadfield runs collocated 1-in-6).

In conjunction with the ambient monitoring, ASARCO collected extensive meteorological data at four sites. Three of the met sites were next to the Pb/TSP monitors. The company is also doing extensive emission inventory work to determine daily emission estimates from the various sources. The emissions data, combined with the meteorological data, in a dispersion model determined concentrations downwind of the smelter. CMB Receptor modeling results were compared with the dispersion modeling results. At present, an effort is being made to reconcile differences between the two models. Final control strategies will be determined based on the analysis of this data and consultation with ASARCO and EPA. When the maximum concentration site is identified, the department proposes to shut down the Hadfield TSP/Pb site and install a new site at the high concentration spot. It is expected that the high concentration site will be installed at the proposed Prickly Pear Creek site (and not the Hastie site), directly north of the ASARCO smelter on the north side of Highway 12. The high concentration site will then become the collocated site. The revised SIP for East Helena is scheduled to be submitted to the EPA for approval by April 1, 1994.

The department intends to continue running the current network of TSP and PM-10 sites (with the exception of installation of the high concentration site and shut down of Hadfield) in Lewis & Clark County and feels that it is adequate for SIP development purposes and compliance tracking.

2.6.3.6 POWELL COUNTY

The air quality concern in Powell County centered around the collection of background TSP and PM-10 data in the western half of the state. The department established a background site for TSP in 1980 at the Terry Smith ranch (30-077-0024) near Ovando. This site

was located in the sparsely populated upper Blackfoot River valley. The area is used almost exclusively for hay production and livestock grazing. In 1985, the department installed a PM-10 monitor at this site to measure background PM-10 and to develop a relationship between background TSP and background PM-10. The site may not have been truly "background" because some high readings were caused by a nearby woodstove and by livestock movement. The site continued operating until September 1987. At that time, the EPA promulgated the PM-10 standard and the sampler was needed at a higher priority Group I area.

It would be desirable to re-establish a background PM-10 site at some western Montana location in the future. The department acknowledges the use of background monitoring for SIP demonstration projects although sites need to be community specific and probably can not be served by a single, regionally based site.

2.6.3.7 SILVER BOW COUNTY

Butte is a city with a population of approximately 33,000. The elevation averages 5300 feet with the Continental Divide surrounding the city on three sides. Wind speeds in Butte are usually low and the area is susceptible to temperature inversions in the fall and winter. The old part of Butte is built on a hillside next to the Berkeley Pit and the new part of town is built on the valley floor to the south.

Particulate monitoring has been conducted in Silver Bow County since 1971. Initial sampling employed standard hi-vol TSP samplers. There have been several TSP sites in Silver Bow County over the years. These included sites in the city-center part of Butte, in Walkerville (north of Butte), out on the flats by the airport, and in Ramsey (by Rhone-Poulenc). There has also been monitoring conducted by companies associated with the mining activities in Butte.

In 1978-80, the department conducted TSP monitoring in Butte as part of the Montana Air Pollution Study (MAPS). The network consisted of five sites in the city center. The department has observed that the city center and more specifically the Greeley School site (30-093-0005) had the highest particulate concentrations. The department decreased its network to this single site in 1984.

Butte was designated non-attainment for TSP based on data from the Greeley School site. A plan was developed and submitted to the EPA which called for a permit from the Anaconda Minerals Company (ARCO) and street paving and sweeping by the city of Butte.

After the plan was implemented, TSP concentrations initially showed compliance with the standards. The department submitted a

redesignation request but disagreements with the EPA over modeling for the attainment demonstration delayed any formal action. In the meantime, the source mix for particulates in Butte changed from predominantly industrial sources to area sources. This was due to closure of the Berkeley Pit and the Weed Concentrator and an economic downturn in the community. In 1985, levels of TSP started to increase. Also in 1985, the department started to monitor for PM-10 at the Greeley School site concurrent with the TSP monitoring.

In 1986, Montana Resources, Inc. purchased all of Arco's holdings in Butte and reopened the ore processing facilities and the new Continental Pit. Montana Resources was obliged to operate under Arco's old permit conditions.

The department started daily sampling at the Greeley School site in September, 1987. During the winter of 1987-88, the department conducted a source apportionment study in Butte. The study involved collecting particulate data using dichotomous samplers and sources were then apportioned through chemical mass balance and optical microscopy techniques.

In March 1988, the department requested approval to move the PM-10 samplers from the roof of the Greeley School onto a roof of a sampling shelter located in the school playground. EPA agreed with this move and the samplers were moved in December 1988. The department also requested a move of the collocated PM-10 sampler from the Helena Cogswell site to Greeley School. This sampler was moved in November 1989. From this date, the Butte Greeley site operated on an every day scedule for the reporting samplers and a 1-in-4 schedule for the collocated samplers. In early 1992, the department requested that the sampling frequency be changed from the every day sampling schedule to a 1-in-6 and a 1-in-2 schedule during the 2nd/3rd and 1st/4th quarters respectively. This request was approved and the schedule went into effect on 7-1-92.

The department submitted the Butte PM-10 SIP to the EPA in November, 1991. The control strategy includes controls on residential wood combustion, paved and unpaved roads and new operating permits for Montana Resources and Rhone-Poulenc.

As part of the SIP, an emission inventory for PM-10 was conducted in Butte. The inventory identified an additional "hot spot" for PM-10 emissions in a residential area near the Harrison Avenue-Interstate 90 intersection. During January 1991, the department established a PM-10 site in the maximum emission inventory grid for Butte. This site was established to confirm whether or not the Greeley School site was the maximum concentration site in Butte. The Butte-Greenhouse (30-093-0008) site was located in an open field near the Harrison Avenue-Interstate 90 intersection. During the 2 1/2 years of operation

the site consistently had lower readings than the Greeley School site. With EPA approval, the department shut down the Greenhouse site at the end of June, 1992.

2.6.4 AQCR 143 - EASTERN MONTANA

2.6.4.1 DANIELS COUNTY

Particulate data was collected in Daniels County from 1975 until 1987. The particulate data was collected as part of background and source impact studies centered around two coal-fired power generating plants located north of the U.S.-Canadian border near Coronach, Saskatchewan. In 1975, the department initiated TSP monitoring near Scobey as part of the Poplar River Basin Environmental Impact Study. At one time there were three sites in the network. The sites were temporarily shut down from June, 1983 to July, 1984 and again from June, 1985 to July, 1986. From September, 1986 until July, 1987 the department operated one site at the Marlenee ranch.

In 1984, the coal-fired power plants started producing electricity. Data collected since that time showed little impact from these sources. The topography of the land north of Scobey is flat to rolling and is used for grain production. The flat terrain lends itself to being a well ventilated area. The power plants have particulate control equipment so little impact is expected from these sources. TSP data collected after the facility went into operation saw little to no impact from the sources and would be considered background for this area. There were no exceedances of the NAAQS or MAAQS.

After the study was completed in 1987, the TSP monitors were removed. At present, the department has no plans to re-establish particulate monitoring in this area.

2.6.4.2 RICHLAND COUNTY

The air quality concerns in Richland County center around Sidney. Sidney (population 5,200) is situated near the Yellowstone River in far eastern Montana near the North Dakota border. In the late 1970s and early 1980s, the area experienced an economic upturn due to oil and gas exploration and development. Much of this upturn has since died down due to gas price stabilization. Other industrial sources in the Sidney area include Montana Dakota Utilities (coal-fired power plant) and Holly Sugar (sugar beet processing facility).

In 1983, the department installed a hi-vol sampler in downtown Sidney (30-083-0010). This site operated until September, 1987. At this time the PM-10 standard had been promulgated by EPA and the

department felt that its resources were better applied to PM-10 problems in the western valleys.

In looking at the data, the TSP concentrations were higher in Sidney than in other communities in eastern Montana. In April, 1987, there were two high readings. Upon investigation, these concentrations were caused by wind-blown fugitive dust emissions. The majority of these TSP concentrations were probably greater than ten microns in size. The department feels that PM-10 concentrations would be within the NAAQS. If the area should experience another economic upturn, the department might consider installing a PM-10 sampler in downtown Sidney.

2.6.4.3 ROSEBUD COUNTY

The air quality concern for particulates in Rosebud County centers around the cities of Colstrip and Ashland. In Colstrip there are four coal-fired power generating plants and two large coal mines. Montana Power Company, Western Energy and Peabody Coal Company have operated particulate sampling networks around their facilities as conditions of their permits. In Ashland, there have been recent concerns due to point source emissions from a tepee burner and area sources including wood and coal burning stoves.

In 1978, the Colstrip area was designated non-attainment for the primary TSP standard based on the MPC #3 site in downtown Colstrip. A plan was submitted which involved permit modifications and control strategies for the nearby coal mines.

In 1984, the department in cooperation with the three companies submitted a request to have the area redesignated attainment for the TSP standards. The EPA reviewed and then approved this request on April 26, 1985. The change in status from non-attainment to attainment applies only to the primary standard and the area remained non-attainment for the secondary TSP standard.

The department requested Montana Power install and operate a PM-10 site at their MPC #3 site (30-087-0700). A sampler was installed in December 1989 and the data is submitted to the department. After a data base has been established, the department will review this data for compliance with the PM-10 NAAQS.

Ashland is a small town with a population of approximately 1,000. The city is located along the Tongue River between the Northern Cheyenne Indian Reservation to the west and the Custer National Forest to the east and south. Ashland is located 21 miles east of Lame Deer which is a PM-10 non-attainment area. The state has no jurisdiction on the tribal lands regarding air quality and plans are being made to bring the area into compliance through tribal and federal offices. Ashland has many of the same source

and topographical influences as Lame Deer. Contributing sources include re-entrained road dust, wood and coal burning and an industrial tepee burner. Depending on resources, the department may install a PM-10 sampler in Ashland.

2.6.5 AQCR 144 - NORTHWESTERN MONTANA

AQCR 144 includes Flathead, Lake, Lincoln, Mineral, Missoula, Ravalli and Sanders counties. This part of Montana is very mountainous and heavily forested. The valleys of northwestern Montana have the poorest atmospheric dispersion in the state. High particulate concentrations have historically plagued this area. Two areas were originally designated non-attainment areas for TSP and now AQCR 144 has six PM-10 non-attainment areas (with two other non-attainment area pending; Whitefish and Thompson Falls). The department has devoted considerable time and resources to solving the particulate problem in northwest Montana.

2.6.5.1 FLATHEAD COUNTY

The particulate problems in Flathead County center around the communities in the greater Flathead valley. These communities include Kalispell, Columbia Falls and Whitefish.

Kalispell has a population of approximately 12,000 persons although the majority of the 59,000 county residents live within a 15 mile radius of the city. Kalispell serves as a business, service and shopping center for the greater Flathead valley. The Flathead valley is located west of the continental divide and is a fairly wide (14 miles across) valley. The climate is mild with calm or low wind speeds. Like many communities in the western part of the state, the area is susceptible to temperature inversions in the fall and winter.

Particulate monitoring has been conducted in Kalispell since 1971. Initial sampling was performed using the standard hi-vol samplers for TSP. There have been several TSP sites in the central part of Kalispell over the years. Many of sampling sites showed exceedances of the NAAQS for TSP. After the Clean Air Act Amendments were adopted in 1977, Kalispell received a fugitive dust exemption and therefore was not designated non-attainment despite violation of the standards.

From 1977 to 1982, Kalispell was one of the communities involved with the Flathead River Basin EIS. Monitoring was conducted at several locations in the basin and it was determined that most of the high concentration sites were associated with anthropogenic sources in the city centers.

The current Kalispell site is at the old Universal Athletics location (30-029-1015) in the downtown area within one block of

U.S. Highway 93. The TSP monitor operated from 1980 until 1987. In 1985, the department installed a PM-10 sampler at this site and ran it concurrent with the TSP sampler. Anticipating promulgation of new PM-10 NAAQS, the department initiated a source apportionment study in Kalispell in 1986 and 1987. On July 31, 1987, the EPA promulgated a new standard for PM-10 and later designated Kalispell a Group I area. The Group I designation required the department to conduct daily sampling and to develop an SIP which would identify source contributions and propose enforceable control strategies within a specific time frame.

A PM-10 SIP for Kalispell was submitted to EPA on June 29, 1990. The source apportionment study identified re-entrained road dust as the predominant source followed by residential wood combustion. The control strategy developed for the area included a sanding material specification, a sweeping and flushing ordinance, and a construction and demolition permitting requirement for dust control. EPA reviewed the SIP and returned it as incomplete on January 22, 1991. They noted that the control strategies were unenforceable by the state. This problem was remedied and a new SIP was submitted to the EPA in November, 1991. The SIP consisted of an emission control plan that controlled fugitive dust emissions from roads, parking lots, construction, and demolition.

The department will continue PM-10 monitoring at the Universal Athletics site to document maintenance and attainment of the standard. The department considers the Universal Athletics site to be located at the maximum concentration area in Kalispell.

Columbia Falls is an industrial town of about 3,000 people located in the northeast corner of the Flathead valley. In the vicinity of Columbia Falls are a plywood-particle board-sawmill complex, an aluminum reduction plant and two other sawmills. Wind patterns in the area are dominated by drainage winds through Badrock Canyon to the east and through a gap north of town which drains the North Fork of the Flathead River. Like Kalispell, the area is susceptible to temperature inversions in the fall and winter months.

Particulate monitoring has been conducted in Columbia Falls since 1971. Initial sampling was performed using standard hi-vol TSP samplers. There were two principal sites over the years. These were at the Anders Residence (30-029-0005) and the Junior High School (30-029-0003). Both sites showed exceedances of the NAAQS for TSP. After the Clean Air Act Amendments were adopted in 1977, Columbia Falls was designated non-attainment for the primary TSP standard based on data from the Anders Residence site.

In 1979, a microinventory was conducted which identified fugitive dust from paved and unpaved streets as accounting for over

90% of the TSP. The control strategy for this area involved the rebuilding of Highway 40 and Nucleus Avenue through Columbia Falls. The paving project for Nucleus Avenue was completed in late fall of 1982 and Highway 40 was finished in the fall of 1984. Following completion of these projects, the annual average for TSP decreased in 1985 but then again rose in 1986 and 1987. The department suspects that other factors influenced the concentrations.

In May 1985, the department installed a PM-10 sampler at the Junior High School (a site that had seen high concentrations in the early 1970s). In October 1985, the department also installed a TSP sampler at the same site. For years the Anders site had been the principal site but had some siting disadvantages. It was located below Nucleus Avenue and was perched on a steeply pitched roof which presented safety problems. After two years of collecting TSP data at the Junior High School site, the department compared Junior High versus Anders and determined that they were measuring the same air mass. To continue tracking particulate levels in Columbia Falls, the department decided to shut down the Anders site and rely solely on the Junior High School site.

In October 1987, the 24-hour PM-10 standard was exceeded resulting in the area being designated a non-attainment area. During the quarter following the exceedance, the department commenced daily sampling. From September 1989 until April 1990, the department conducted a source apportionment study in Columbia Falls. The results from this study indicated that fugitive dust was the major contributor to the PM-10 problem. Therefore a SIP was developed and submitted to the EPA in November 1991. The SIP consisted of an emission control plan that controlled fugitive dust emissions from roads, parking lots, construction, and demolition.

The department continues to operate the PM-10 samplers at the Junior High School site. Ambient PM-10 data from 1988 through August, 1993 has shown no violations of either the annual or short-term PM-10 standards. The department will continue to operate the PM-10 site at its present location and will use it for attainment and maintenance demonstrations.

Whitefish is a city of approximately 4,300 people located at the northwest corner of the Flathead valley. Whitefish is not a major commercial or industrial center but a year-around tourist destination. Like Kalispell and Columbia Falls, the area is susceptible to temperature inversions in the fall and winter months. The source apportionment study in Kalispell showed that re-entrained road dust and residential wood combustion are major and minor contributors respectively, to ambient particulate concentrations. Whitefish is likely to have the same source mix and concentrations as Kalispell.

As part of the Flathead River Basin EIS, the department

measured TSP in Whitefish from 1981 to 1983. The data showed that the area was in compliance with the TSP NAAQS. However, the department believes that the site was not located in the maximum concentration area. As a result of the 1990 Network Review, the department installed a PM-10 site in Whitefish at Markus Foods (029-0039). This site is located in the central business district of Whitefish. The department installed this site due to public concern and Whitefish's proximity to other PM-10 nonattainment areas in Kalispell and Columbia Falls. Sampling began on April 30, 1991 and the network documentation forms were approved by the EPA. During February and March of 1992, eight exceedances were measured at the Markus Foods site resulting in the proposal for designation of Whitefish as nonattainment for PM-10. It is expected that Whitefish will recieve official designation sometime in October, 1993.

A source apportionment study (CMB) in Whitefish began on January 1, 1993 and is scheduled to run during the 1993 calender year. The study trailer is located across the alley almost directly east of Markus Foods and a background site consisting of a single SA1200 sampler was established approximately 1 1/2 miles east of Whitefish (Patterson Corral 30-029-0041). The results from the CMB study will be incorporated into the SIP when it is written.

To confirm the Markus Foods site as the maximum PM-10 site, a PM-10 saturation study was done during February, March, and April of 1993. Eleven sites, most of which were located in areas with potentially high PM-10 levels were chosen and portable saturation samplers were deployed at these sites. The results of the study revealed that elevated PM-10 levels occur in the general downtown area and on south US Highway 93; with no statistical difference between the two. As a result of this study, the department intends to maintain Markus Foods as the maximum concentration site and there are no plans for additional sites in Whitefish.

2.6.5.2 LINCOLN COUNTY

The particulate problems in Lincoln County center around the communities of Libby, Eureka and Troy.

Libby is a small town with a population of approximately 2,500 persons. It is located along the Kootenai River in extreme northwestern Montana. The Kootenai valley runs approximately east to west in Libby and is only about 2 miles wide. The Libby area may have the worst ventilation of any community in Montana. During the fall and winter months, the winds are almost always calm or very light. This, along with persistent temperature inversions, results in high pollutant levels in the narrow valley.

Particulate monitoring has been conducted in Libby since the mid 1970s. The principal TSP sites were at the Brown Residence

(30-053-0010) and the Lincoln County Courthouse (30-053-0012). Concentrations recorded at these sites exceeded both the short-term (24-hour) and annual TSP NAAQS. The high readings compelled the department to initiate an air pollution study during the winter of 1984-85. The intent of the study was to characterize source contributions to particulate concentrations in Libby. Understandings were acquired by this study but some techniques needed to be refined and other studies were needed to correctly apportion sources.

In May 1985, the department installed a PM-10 sampler at the Courthouse site. In August 1985, the department discontinued the TSP sampler at the Brown Residence. Data analysis revealed that hi-vol TSP samplers at the Lincoln County Courthouse and the Brown Residence sites were measuring the same airshed.

From October 1987 until December 1988, the department conducted a source apportionment study in Libby. This involved collecting fine particulate data and analyzing it chemically. Chemical fingerprints were collected from the various sources and the CMB receptor model was used to apportion the sources. As a backup to CMB, the department apportioned sources using the optical microscopy technique. The results of the study showed that re-entrained road dust and residential wood combustion were the principal sources.

A SIP was submitted to EPA on 11-25-91, and upon review, the EPA requested that the department commit to several revisions in order for the SIP to be considered for approval. These revisions were submitted to the EPA on 5-24-93. The department is currently awaiting SIP approval by the EPA.

The department will maintain the PM-10 site on the Lincoln County Courthouse. In addition, the department will install a continuous PM-10 monitor (TEOM) at the Lincoln County Annex, one block east of the Courthouse. The TEOM will be used in conjunction with the Libby wood stove curtailment program, the Montana Smoke Management program, and to correlate data with the PM-10 sampler on the courthouse.

The department believes that these sites accurately represent the maximum PM-10 concentration area of Libby. The Courthouse site will be used for compliance purposes to judge the attainment and maintenance of the standard. The department will also maintain a collocated sampler at this location. Since the ratio of the maximum PM-10 concentrations to the standard is greater than 1.2, the Federal Register (40 CFR 58.13) allows a less frequent sampling schedule. In early 1992, the department requested a reduced sampling frequency of 1-in-2 and 1-in-6 during the 1st/4th and 2nd/3rd quarters respectively. This request was approved by the EPA and went into effect on 7-1-92.

Eureka is a small town in northwestern Montana with a population of approximately 950. The town is situated in rolling hills along the Tobacco River approximately five miles upstream from Lake Koocanusa. Particulate monitoring for TSP started in 1984. Twenty-four hour concentrations exceeded the short-term TSP NAAQS on a few occasions. In 1987, the department replaced the TSP sampler with a PM-10 sampler and sampling continued through June, 1992. Since PM-10 levels were low, sampling was discontinued.

Troy is a small town 18 miles west of Libby with a population of approximately 1,100. The town is situated along the Kootenai River valley and like Libby has some of the worst ventilation in the state. Although the population is low, community leaders in Lincoln County have indicated that Troy may also have particulate levels that exceed the standard. The department installed two samplers at the high school in the northwestern part of town, just off of US Highway 93 in October of 1991. In the nearly two years that this site has been operating, readings have been consistently low. If this trend continues through another winter of sampling, the department may request that this site be discontinued.

2.6.5.3 MISSOULA COUNTY

Particulate problems in Missoula County center around the city of Missoula. Missoula is situated at the confluence of the Bitterroot and Clark Fork Rivers in western Montana. The city proper has a population of approximately 45,000 persons, but the Missoula valley contains approximately 75,000 persons. The Missoula valley is fairly narrow (approximately 6 miles across) and similar to other western Montana valleys in that it is susceptible to temperature inversions in the fall and winter months and wind speeds are fairly calm throughout the year.

Particulate monitoring in Missoula has been conducted since 1971 at several sites in the Missoula valley. The initial TSP particulate concentrations were measured with the standard hi-vol samplers. During the early to mid 1970s, the highest concentrations were measured in the downtown area at the Courthouse Roof site (30-063-0001). In 1977, after the passage of the Clean Air Act Amendments, Missoula was designated non-attainment for the primary TSP standards based on data from this site. As part of the SIP to control TSP, the city of Missoula incorporated a systematic program of street sweeping and flushing to show attainment by 1982. Although not part of the plan, Missoula implemented several control measures directed at emissions from residential wood combustion. The control measures brought the area into compliance with the annual NAAQS but occasionally the 24-hour standard was exceeded.

Over the years, the air monitoring network in Missoula has been quite extensive and comprehensive. The Missoula City-County Health Department (MCCHD) has monitored for particulates at several

locations. These include sites in downtown Missoula [Courthouse Roof (30-063-0001) and Health Department (30-063-0031)] and south central Missoula [Rose Park (30-063-0020), Lions Park (30-063-0019), and Boyd Park (30-063-0024)]. In addition, the MCCHD has operated sites in Bonner (near a major sawmill/plywood factory), in Lolo (at the waste water treatment plant), near Frenchtown (by a kraft pulp mill), in East Missoula, in the Rattlesnake area, in southwest Missoula near the south hills and on the western edge of the city. For years MCCHD operated daily TSP monitoring at most of their major sites and obtained profiles of pollutant trends in the Missoula valley. This was very resource intensive and the MCCHD sought ways to narrow the scope of work. In 1984, MCCHD also started collecting PM-10 data at two of their sites in addition to all of their TSP data.

In the 1986 Network Review, the department and the MCCHD suggested condensing the size of the Missoula network and focusing on certain sites that would be considered maximum concentration sites. The sites would also be used for the county's episode monitoring program. After data review, the department concluded that the Boyd Park and Rose Park sites were measuring the same airshed. This resulted in shutting down the Rose Park site and transferring the episode monitoring to the Boyd Park site. The Boyd Park site is the principal monitoring site for particulates in the south central part of Missoula while the Health Department site is the primary site on the north side of Missoula in the downtown area.

During the fourth quarter of 1986 and the first quarter of 1987, the MCCHD conducted a PM-10 source apportionment study. The study showed that the major sources contributing to the PM-10 problem were re-entrained road dust from the city's streets followed by residential wood combustion during the winter heating season. Missoula's SIP was developed and submitted to EPA on June 29, 1990. EPA returned the SIP in a letter dated March 13, 1991. They noted that it was administratively and technically incomplete. In addition, they noted that the state and county do not have the authority to implement the plan and there were other problems related to enforceability. With the enactment of the Federal Clean Air Act amendments on November 15, 1990, the Missoula area was designated as a moderate PM-10 nonattainment area. The PM-10 SIP was corrected and re-submitted in June 1992.

The emission inventories developed in the SIP showed that the highest concentration grids are in south Missoula (where the Boyd Park site is located) and in downtown Missoula (where the Health Department site is located). The department and the MCCHD will continue to operate these two sites to track compliance with the NAAQS.

The MCCHD will continue to jointly operate two PM-10 sites with Stone Container near their Frenchtown kraft pulp mill. These sites were operated as TSP sites until 5-18-92, when the samplers were switched over to PM-10 samplers.

2.6.5.4 RAVALLI COUNTY

Particulate concerns in Ravalli County center around the city of Hamilton. Hamilton is a small (population 2,700), but rapidly growing community situated in the center of the Bitterroot valley. Hamilton is about 50 miles south of Missoula and about 300 feet higher in elevation. Hamilton often experiences better wintertime ventilation than nearby Missoula. On many occasions, when Missoula is fogged in and experiencing high particulate concentrations, Hamilton is sunny and relatively clear. There are times, however, when temperature inversions in Hamilton can trap pollutants and cause elevated levels.

With this in mind, in 1983 the department began TSP sampling at the Ravalli County Courthouse (30-081-0001) in the city center. This was initiated in part due to citizen complaints about dust and wood stove emissions, and interest by the League of Women Voters. In 1986, the department installed a PM-10 sampler at the same location and continued to collect TSP and PM-10 data until 1987. For a western Montana valley, the department was somewhat surprised at the relatively low TSP and PM-10 readings. Maximum concentrations were observed during the winter and spring but were well within the NAAQS and MAAQS.

On July 31, 1987, the EPA promulgated new standards for PM-10. The standards required daily monitoring at Group I areas and every other day monitoring at Group II areas. Based upon these requirements and the low concentrations recorded at the Hamilton site, the department discontinued both TSP and PM-10 monitoring during the fall of 1987. However, because of the growing population and renewed citizen concerns, the department is considering the installation of a PM-10 site in Hamilton, provided resources are available.

2.6.5.5 SANDERS COUNTY

Particulate concerns in Sanders County center around the city of Thompson Falls. Thompson Falls is a small town with a population of approximately 1,300 persons. It lies on the north side of the Thompson Falls Reservoir, a small impoundment on the Clark Fork River. The Clark Fork valley around Thompson Falls runs east and west and mountains rise to 7000 feet both to the north and south of Thompson Falls. Like other western Montana valleys, the area experiences temperature inversions during the fall and winter months.

The department conducted limited TSP monitoring in the early 1970s and again in 1978. It was not until 1983 that the department established a permanent TSP site at the Sanders County Courthouse (30-089-0003). Readings collected during the first few years showed levels exceeding the NAAQS for TSP. In 1985, the department installed a PM-10 sampler at the same location. The PM-10 data from 1985 to 1987 was somewhat limited but did record concentrations approaching the proposed NAAQS for PM-10.

On July 31, 1987, the EPA promulgated a new standard for PM-10. The EPA used historic TSP and PM-10 data and ran statistics which showed that Thompson Falls had a probability between 20% and 95% of exceeding the PM-10 NAAQS. Consequently, the area was designated as Group II for PM-10. This designation required every other day PM-10 sampling and a committal SIP.

The department started every other day sampling in October, 1987. In February 1988, the Sanders County Courthouse site recorded a concentration in excess of the 24-hour PM-10 standard. The most likely sources of particulates are re-entrained dust from paved and unpaved streets, residential wood combustion, and emissions from a nearby sawmill. This exceedance required the state to conduct daily sampling and to develop a SIP with control strategies to bring the area into compliance. The department initiated daily sampling in July 1988 which continued until July 1, 1992. The site currently runs on a 1-in-6 and a 1-in-2 frequency during the 2nd/3rd and 1st/4th quarters respectively.

The department performed a source apportionment study in Thompson Falls from October 1990 until April 1991. The CMB monitoring trailer was installed at the Railroad site (30-089-0005) across Main Street from the Courthouse site. In addition, the department installed a background PM-10 sampler in an open field at the Muster Ranch (30-089-0006) a few miles north of Thompson Falls.

Following a technical study and emission inventory in Thompson Falls, it was determined that re-entrained road dust was the major contributing source of PM-10 emissions. Minor sources were shown to be wood combustion and the WI Forest Products boilers. The control plan that is currently being developed will most likely include the implementation and enforcement of specifications for sanding materials and more frequent street sweeping.

2.7 METEOROLOGICAL MONITORING

2.7.1 AQCR 140 - SOUTH CENTRAL MONTANA

AQCR 140 is located in south central Montana and includes physical features common to all of the other AQCRs in the state. The Yellowstone, Musselshell cut through the region from west to east. The Highwood, Big Belt, Crazy and Absaroka Mountains border

the region to the west and the southern border, formed by Wyoming, includes the Beartooth, Pryor and Big Horn Mountains. To the east the boundary cuts through rolling plains and foothills and includes the lower portion of the Musselshell River.

Due to the diverse nature of the terrain and climate in this region, dispersion characteristics are highly localized and are quite variable. Mountainous terrain can provide shelter from prevailing winds and severely limit dispersion of pollutants in one area while funnelling high winds into another to greatly enhance the dispersion. Temperature inversions which trap pollutants are common in this region throughout the year but the depth, duration and intensity vary widely from the mountains to the plains. Inversions on the plains seldom persist past noon and are usually shallow and weak. Inversions in the mountainous areas are usually much stronger and deeper and can persist for several days during the fall and winter. Wind speed and direction patterns in the mountains are significantly affected by terrain and generalizations or comparisons to any existing measurements at other sites are not very practical. Wind patterns on the flatter portion of the region can be evaluated by comparison to existing sites and generally show the prevailing winds to be from the west and southwest.

2.7.1.1 YELLOWSTONE COUNTY

Meteorological monitoring in Yellowstone County consists of two sites operated by the department, one site operated by the Yellowstone County Air Pollution Control (YCAPC), and three sites operated by a group of Billings/Laurel industries called BLAQTC.

As stated previously, Billings and Laurel are situated along the Yellowstone River valley in south central Montana. The Yellowstone River valley runs from southwest to northeast and is a predominant topographical influence on the airflow in the area. In Billings, there are cliffs or rimrocks located both north and south of the river which also tend to cause channeling. The distance between the north and south rims ranges from about one to five miles. In Laurel, the valley tends to be a little wider and the predominant high terrain is not close by. The cities of Billings and Laurel and all of the industrial sources are located along the river valley. Nearby terrain is often higher than the highest smoke stacks.

The department operates a 10 meter meteorological tower at its site at Coburn Road (30-111-0066). The met sensors were previously on a six foot tripod on top of the monitoring trailer. On 11-14-90, the department installed a 10 meter tower in the field near the monitoring shelter. Temperature data (at two meter probe height) is also collected at the site. The wind data analog signal is currently recorded on a chart recorder and then digitized and stored on magnetic media. The Coburn Road site is situated about

300 feet above the valley floor on the south rims. The wind data is used to determine which source or sources contributed to SO_2 readings at the site. The wind data was also used in connection with the area wide SO_2 dispersion modeling study.

The department also operates met sensors at its site at Sacrifice Cliff (30-111-0080). This site is located on a six foot tripod on top of the sampling shelter. Because of the inability to comply with siting requirements (too close to Sacrifice Cliff) and the proximity to the Coburn Road site, the department decided not to install and guy a 10 meter tower at this site. However, like Coburn Road, the wind data is used to determine which source or sources contributed to SO_2 readings at the site.

The YCAPC operates a met sensor at its Mount Olive CO site (30-111-0079). The met sensor is on a six foot tripod on top of the monitoring shelter. The site does not meet siting criteria for probe height but the met data is used for reviewing the meteorological conditions contributing to high CO readings.

BLAQTC operates three meteorological stations at its three SO_2 sites in Billings and Laurel. These sites are Lockwood Park (30-111-1065), Laurel-BLAQTC (30-111-0016) and Brickyard Lane (30-111-2005). All meteorological equipment is located on 10 meter towers. Analog signals are recorded on chart with the digital signal being stored on magnetic disk. The wind data is used to determine which source or sources contributed to SO_2 readings at the site. The wind data was used in the area wide SO_2 dispersion modeling study.

2.7.2 AQCR 141 - NORTH CENTRAL MONTANA

AQCR 141, located in north central Montana, is a region of rolling glaciated plains. The Milk, Marias, Teton and Missouri Rivers cut across the region from the west to east creating substantial river valleys that are hundreds of feet lower than the upland bench areas. Relatively small, isolated mountain ranges, the Highwood, Bear Paw and Little Rocky Mountains, rise up from the plains in the eastern half of the region. The western boundary of the region is formed by the Continental Divide and includes most of the area known as the Rocky Mountain Front. The foothills of the Big and Little Belt Mountains form the southern boundary along with the Missouri River. The eastern boundary cuts across the plains north of the Little Rocky Mountains to the Canadian border which is the northern boundary of the region.

With the exception of the isolated mountainous areas most of the region experiences a similar climatological regime with warm dry summers and cold dry winters interrupted by occasional chinooks. Dispersion potential in the region is generally excellent due to persistent and often very strong winds. Temperature inversions in the area, though frequent, are usually

shallow and seldom last past noon. The exceptions to this rule are to be found in the mountainous areas and occasionally in the river valleys. During the winter it is possible to have a warm wind blowing along a bench while cold air remains trapped in the bottom of a valley only a few miles away. Persistent inversions have also been noted in the narrow valleys of the Little Rocky Mountains. The wind flow over the region is generally from the west or southwest unless cold northerly winds are sweeping down from the arctic. Precipitation amounts are uniformly low over the entire region.

2.7.2.1 CASCADE COUNTY

Meteorological monitoring in Cascade County consists of one site operated by the Cascade County Health Department (CCHD) at its CO site at Skyway Conoco (30-013-1023) on 10th Avenue South in Great Falls. The met sensors are on a 6 foot tripod on top of the monitoring shelter. The wind data analog signal is currently recorded on a chart recorder and then digitized and stored on magnetic media. The met data is used to review the meteorological conditions contributing to high CO readings. The department has no plans to upgrade the meteorological monitors to a 10 meter tower due to safety concerns.

2.7.3 AQCR 142 - SOUTHWESTERN MONTANA

AQCR 142 is located in the southwestern corner of Montana. The region contains several distinct mountain ranges separated by wide valleys. The valleys run north and south and can be thousands of feet lower than the surrounding mountains. Tributaries for the Missouri, Yellowstone and Clark Fork Rivers have their beginnings in this area.

The mountainous terrain in the region substantially impacts the weather patterns. Precipitation is often limited to the higher mountains while the valleys remain much drier. Winds along the mountain tops are generally westerly and frequently will not reach down into the north-south running valleys. Inversions are frequent and during the fall and winter can persist for days at a time. Occasional severe inversions can be several thousands of feet deep and very strong allowing almost no dispersion of pollutants. This allows even small emission sources to produce localized areas of poor air quality. Wind speed and direction patterns in this region are highly localized and cannot be adequately characterized by off-site measurements.

2.7.3.1 DEER LODGE COUNTY

Meteorological monitoring in Deer Lodge County used to consist of three sites operated by consultants for the ARCO Coal Company in support of data collection for the Anaconda Superfund site. The three sites were Teressa Ann Terrace (30-023-0010), Zinc Processing (30-023-0011), and Mill Creek (30-023-0706). The Teressa Ann Terrace site was located at the primary PM-10 monitoring site for the Anaconda Group II area. All meteorological sensors were sited according to EPA protocol and were located on 10 meter towers. Data was submitted to the state and updated to AIRS. The Teressa Ann site was terminated on September 30, 1992; the other sites were shut down on June 8, 1992.

2.7.3.2 LEWIS & CLARK COUNTY

Meteorological monitoring in Lewis & Clark County was conducted at one site operated by the Lewis & Clark County Health Department (LCCHD) in Helena and at four sites operated by ASARCO in East Helena. LCCHD's site was at Lincoln School (30-049-0018) in the lower central part of Helena. The met sensors were on a 6 foot tripod on the monitoring trailer. Meteorological data from this site was used in concurrence with PM-10 and nephelometer data to call alerts for the county's wintertime wood stove curtailment program. The county air program now obtains dispersion forecasts from the Helena NWS office. The reporting of met data to AIRS for this site stopped on December 31, 1992 and the equipment was removed in the summer of 1993.

ASARCO's original met sites in East Helena are located at the Firehall (30-049-0714), Old Railroad (30-049-0726), Kennedy Park (30-049-0703) and Zinc Stack (30-049-0721). Meteorological sensors at the zinc stack are located at mid-stack level and at stack top. All other meteorological sites are located at 10 meter towers (except Firehall which is at 12m) and conform to EPA siting criteria. All four meteorological sites have operated since 12-1-89. Data collected from these sites is used in connection with the East Helena Lead and SO_2 SIPs. The meteorological data is used as input to dispersion models to assess impacts from the smelter and to address control strategies. As part of the SO_2 SIP revisions ASARCO added two new met sites which utilize 10 meter towers and meet all siting requirements. Data collection at the Top of Microwave (30-043-0909) and the McClellan Creek Road #5 (30-043-0912) sites started on April 1, 1993.

Digital signals from met sensors are directly written to magnetic storage media. No chart recorders are used with these monitors. The company uses QA procedures which allow for proper data collection.

2.7.4 AQCR 143 - EASTERN MONTANA

AQCR 143 makes up the eastern third of Montana. Rolling glaciated plains cover the northern half of the region while rolling sedimentary plains cover the southern half. The Missouri River cuts from west to east in a deep valley in the glaciated northern half of the region while the Yellowstone River travels to the northeast in a wide but shallower valley through the southern half. The terrain is often quite rough but generally does not produce noticeable terrain effects on the meteorology and climatology of this region.

The weather here is typical of the northern Great Plains with hot dry summers and cold dry winters. Chinooks occur but are not as frequent here as they are in AQCR 141. Precipitation totals are generally low throughout the region with the largest amounts usually coming all at once in thunderstorms. The wind patterns here can be characterized by existing off-site measurements and are usually westerly. Dispersion potential in this region is excellent as a rule without the strong persistent inversions present in the western part of the state. Inversions can be frequent, especially in the southern part of the region, but are usually shallow and short-lived.

2.7.4.1 ROSEBUD COUNTY

Meteorological monitoring in Rosebud County centers around Montana Power Company's coal-fired power plants in Colstrip. MPC operates three meteorological sites. These are at MPC #1 (30-087-0701), MPC #2 (30-087-0702), and MPC #3 (30-087-0700). MPC sites #1 through #3 are located adjacent to MPC's SO_2 and NO_2 continuous monitoring sites. The data is used to review meteorological conditions that may cause elevated readings. MPC #4 (30-087-0704) and MPC #14 (30-087-0614) were shut down on June 30, 1992 and the terminations were approved in an EPA-letter dated April 3, 1992.

2.7.5 AQCR 144 - NORTHWESTERN MONTANA

AQCR 144 makes up the northwestern corner of Montana and is entirely west of the Continental Divide. The terrain here is uniformly mountainous as is AQCR 142 but the valleys are generally narrower and lower than the valleys of AQCR 142. The mountain ranges and valleys here also run from the north to the south with the mountaintops thousands of feet higher than the valley floors. The area is drained by the Clark Fork and Kootenai Rivers and includes all of the Flathead and Bitterroot drainages.

The strong Pacific influence and mountainous terrain in the region substantially impact the weather. Precipitation amounts here are the highest in the state and the winters are also warmer and wetter. Winds along the mountaintops are generally westerly

and frequently will not reach down into the north-south valleys. Inversions are frequent and during the fall and winter can persist for many days. Warm Pacific air frequently overrides colder air trapped in the valleys producing severe inversions several thousands of feet deep causing poor pollutant dispersion. This allows small emission sources to produce localized areas of poor air quality because dispersion potential in this region is the lowest in the state. Wind speed and direction patterns in this region are highly localized and cannot be adequately characterized by off-site measurements.

2.7.5.1 MISSOULA COUNTY

Meteorological monitoring in Missoula was conducted at the Missoula City-County Health Department's CO site at Malfunction Junction (30-063-0005). The meteorological sensors were on a six foot tripod on top of the sampling shelter.

Due to the multiple use conditions at the fairgrounds (where the site was located) and safety reasons, it was impossible to install and guy a 10 meter tower at this site. The department and Missoula County decided that met data collection would be stopped on April 1, 1993, since the data collected with the tripod could not be used for dispersion modeling purposes. The absence of met data at the Malfunction Junction site is not a serious problem since nearly all of the CO NAAQS exceedances in Missoula have occurred under stagnant air conditions.

2.8 CONTINUOUS PARTICULATE MONITORING

2.8.1 AQCR 142 - SOUTHWESTERN MONTANA

2.8.1.1 LEWIS & CLARK COUNTY

Visibility data was collected using a nephelometer at the Lewis & Clark County Health Department's site at Lincoln School (30-049-0018). The county used the visibility data correlated to PM-10 levels, to call alerts for their mandatory winter-time wood stove curtailment program. The aging nephelometer was replaced with a Tapered Element Ocscillating Microbalance (TEOM) in August, 1993. The TEOM, unlike the nephelometer, outputs real-time PM-10 data and is expected to be more reliable and user friendly.

2.8.1.2 SILVER BOW COUNTY

Visibility data was collected using a nephelometer at the Butte-Greeley School site (30-093-0005). The visibility data, correlated to PM-10 levels, was operated by the Butte-Silver Bow Health Department to call alerts for their mandatory winter-time

wood stove curtailment program. The BSBHD nephelometer was replaced with a TEOM and went into operation in August, 1993.

2.8.2 AQCR 144 - NORTHWESTERN MONTANA

2.8.2.1 FLATHEAD COUNTY

Visibility data was collected using a nephelometer at the Courthouse East site (30-029-1017) in Kalispell. A nephelometer was operated by the Flathead County Health Department in response to citizens' concerns on air quality. The nephelometer was used to estimate particulate levels for the voluntary winter-time wood stove curtailment program. The nephelometer was replaced with a TEOM and went into operation in September, 1993.

2.8.2.2 LINCOLN COUNTY

Visibility data was collected using a nephelometer at the County Courthouse Annex site (30-053-0018) in Libby. The nephelometer was operated by the Lincoln County Health Department and used to call alerts for their mandatory winter-time wood stove curtailment program. The nephelometer is expected to be replaced by a TEOM sometime in early October, 1993.

2.8.2.3 MISSOULA COUNTY

PM-10 data is collected in Missoula using a beta attenuation monitor (BAM) at the Boyd Park site (30-063-0024). The signal from the BAM at the monitoring site is relayed to the Missoula City-County Health Department's offices through a modem. Missoula personnel use the BAM data and forecast information from the National Weather Service to make predictions for their mandatory winter-time residential wood burning curtailment program.

3.0 NETWORK MODIFICATIONS

As stated in the introduction, the department must conduct a review (1) to determine if the system (monitoring network) meets the monitoring objectives defined in Appendix D of 40 CFR Part 58, and (2) to identify needed modifications of the network, such as the termination or relocation of unnecessary stations or the establishment of new stations that may be necessary.

The department is also required to develop and implement an annual schedule modifying the network in order to eliminate any unnecessary stations or to correct any inadequacies indicated by the results of the annual review. The department must consult with the Regional Administrator of EPA during the development of the schedule to modify the monitoring program. The final schedule and modifications are subject to the approval of the Regional Administrator.

The regional office of the EPA (Region VIII) established a procedure and form to use to document and request modifications to the network. This form is known as the Network Modification Request Form. The state is required to submit this form in advance requesting EPA approval of any proposed network modification.

Network modifications conducted during 1992 and 1993 are listed in Table 1. These modifications and any recent discussions about the sites (including future considerations) are underlined. Summaries of EPA's responses follow the department's requests. In some cases, the department has filled out network modification request forms to document the location and features of a site. When there have been no requested modifications, EPA has not responded.

4.0 AIR MONITORING EQUIPMENT NEEDS

The department operates various equipment to measure pollutants and meteorological parameters at monitoring sites across Montana. The department also uses shelters, calibrators and various other equipment and devices in support of that monitoring. As the equipment becomes old, it often needs to be upgraded or replaced. When the department adds sites to its network, new equipment must be purchased. Each year the department budgets money to purchase new and replacement equipment.

During the past two fiscal years, the department has purchased several pieces of equipment. These are listed in Tables 3 and 4. In fiscal year 1992, the department spent a total of $63,911 on air monitoring equipment. This included $34,810 for replacement items and $29,101 for new equipment. In fiscal year 1993, the department spent a total of $76,226 on air monitoring equipment. This included $73,186 for replacement items and $3,040 for new equipment.

Table 5 is a list of air monitoring equipment that is currently used at state and county operated sites, or will be used at proposed sites. The table also includes equipment used/needed for special projects. The table lists equipment, manufacturer, model, acquisition date, condition and replacement costs at each site. As requested by EPA, an equipment replacement plan is provided on the table. In FY 94 the department intends to spend $91,150 for new or replacement equipment. In FY 95 the department intends to spend another $27,150 for new or replacement equipment. In FY 96 the department intends to spend $59,450 for new or replacement equipment. Depending on funding availability, the department may spend more or less for replacement equipment in the next three fiscal years.

5.0 SUMMARY AND CONCLUSIONS

5.1 EXECUTIVE SUMMARY

Each year the department is required to develop and implement an annual schedule modifying its air monitoring network in order to eliminate any unnecessary stations or to correct any inadequacies indicated by the results of the annual review. The department must consult with the Regional Administrator of EPA during the development of the schedule to modify the monitoring program. The final schedule and modifications are subject to the approval of the Regional Administrator.

During 1993, the department and county agencies operated 25 air monitoring stations. Some of the stations collected multiple parameters. There were 16 PM-10 sites, 4 CO sites, 2 SO_2 sites, 5 TSP/lead sites, and 5 meteorological monitoring sites. The department also relies on companies to monitor air quality around their own facilities. Company monitors listed in this report are mostly those required by Prevention of Significant Deterioration (PSD) permits or needed to assess ambient levels in or near federally designated non-attainment areas.

In 1993, the department listed 37 goals or modifications to the network. To date, the department has implemented 32 of these goals. Some proposed new sites were not installed due to funding, equipment and personnel limitations. For 1994, the department has listed 19 goals or modifications to the network. Some of these goals are carryovers from the year before.

5.2 HISTORICAL SUMMARY

The Montana ambient air quality network has undergone many changes from 1986 to 1993. The majority of the changes had to do with particulate monitoring. In the mid 1980s the department had a large network of TSP samplers in the state. These were located in large communities, small communities and near problem areas. On July 31, 1987 the EPA promulgated a new standard for PM-10. Several areas in Montana were designated Group I (greater than 95% probability of exceeding the standard) and Group II (between 20% and 95% probability of exceeding the standard). These designations required the department to do daily sampling in the Group I areas and every other day sampling at the Group II areas. As a consequence, many of the TSP sites were discontinued and PM-10 samplers were moved to allow adequate coverage in the Group I and II areas. In 1993, the first PM-10 saturation study was conducted in Whitefish. Also, the nephelometers, used by the county air agencies to operate episodic curtailment programs, were replaced by state-of-the-art continuous PM-10 samplers (TEOMS).

The next biggest change came in the SO_2 monitoring network in the Billings/Laurel area. In early 1987, the department was nearly out of the SO_2 monitoring business in Yellowstone County. This was mostly due to personnel cutbacks and prioritization of resources. Due to legislative funding and the creation of the Billings/Laurel Air Quality Technical Committee, renewed emphasis was placed on SO_2 monitoring.

Two dispersion modeling studies resulted in the establishment of an EPA-approved modeled maximum SO_2 site, Sacrifice Cliff, in Billings. Two additional industry operated SO_2 sites will be installed by the end of 1993, both sited as a result of dispersion modeling. By the end of 1993 there should be seven SO_2 sites operating in Billings-Laurel-Lockwood area.

In April 1991, the EPA notified the department that the East Helena SO_2 SIP was inadequate. As a result of the dispersion modeling performed for the SIP revision the SO_2 monitoring network was greatly expanded. There are now 13 SO_2 sites operating around the ASARCO lead smelter.

In October 1988, the EPA notified the department that the East Helena lead SIP was inadequate. As a result, the lead monitoring network needed to be expanded in support of the SIP development process. At present there are four lead monitoring stations around East Helena.

For carbon monoxide, the size of the network has stayed the same but adjustments have been made to locate sites in microscale maximum concentration sites. In 1988, the CO site in Billings was moved nearer Main Street (Exposition Drive) to locate it in a microscale location. As a result of the December 1991 saturation study the Metra CO site was shut down and two new microscale CO sites were established in Billings.

The CO site in Great Falls was also moved to accommodate the microscale siting requirement. A CO saturation study was conducted in January 1992 which confirmed that the current CO site in Great Falls is at the maximum concentration location.

In Missoula the department shut down one of two CO sites: (1) to economize resources and (2) because adequate maximum concentration coverage was provided with the one site. These actions were confirmed by a saturation study conducted in December 1992.

The department is proposing locating CO monitors in Butte and Kalispell. These areas are suspected to have elevated CO levels. The department intends to do saturation studies in these areas and if resources are available, the department will install monitors in these communities.

With each successive network review, the department will continue to refine its network. This document shows (in part) that the department will continue to cooperate with industries and will rely on their resources to conduct monitoring associated with their sources. This is evident in East Helena (Pb & SO_2 monitoring), Billings (SO_2 monitoring), Colstrip (PM-10, SO_2 and NO_2 monitoring) and Missoula (PM-10 monitoring).

5.3 CURRENT AIR MONITORING NETWORK

During 1993, the department and county agencies operated 25 air monitoring stations. Some of the stations collected multiple parameters. There were 16 PM-10 sites, 4 CO sites, 2 SO_2 sites, 5 TSP/lead sites and 5 meteorological monitoring sites. Table 2 provides a "short list" of the current air monitoring stations operated by state and county governments.

There are also several sites on Table 2 that are operated by companies around their facilities. The companies are generally required to operate these sites because of Prevention of Significant Deterioration (PSD) permits or because they are in or near areas designated non-attainment of a National Ambient Air Quality Standard (NAAQS).

5.4 EQUIPMENT STATUS

As mentioned in Section 4.0 AIR MONITORING EQUIPMENT NEEDS, the department operates various equipment to measure pollutants and meteorological parameters at monitoring sites across Montana. During the past two fiscal years, the department has purchased several pieces of equipment. In fiscal year 1992, the department spent a total of $63,911 on air monitoring equipment. This included $34,810 for replacement items and $29,101 for new equipment. In fiscal year 1993, the department spent a total of $76,226 on air monitoring equipment. This included $73,186 for replacement items and $3,040 for new equipment.

During the next three fiscal years the department plans to spend approximately $177,750 to purchase equipment that will be used to replace existing old equipment or equip new sites. Depending on the availability of funding and the priority placed on new sites, the department will purchase equipment for these sites.

The department remains committed to maintaining its network at a high level of dependability. The department is committed to upgrading its system and using the best available equipment to achieve a high level of data quality and data quantity (percent data recovery).

5.5 NETWORK MODIFICATIONS FOR FY93

Table 6 lists the network modifications goals for fiscal year 1993. A status statement is written below each of the goals. Of the 37 items listed, the department completed 32. The completed items mostly included installation or sampling frequency changes for PM-10 areas. 5 items were not completed. Major highlights included establishing two new CO sites in Billings and documentating the maximum CO concentration locations in Billings, Great Falls and Missoula, all as a result of saturation studies. The department installed an SO_2 site in Billings at the modeled maximum location. Also, the SO_2 monitoring network around the ASARCO smelter in East Helena was greatly expanded. Two areas (Kalispell and Butte) were recommended as potential new areas for CO monitoring. The department needs to conduct saturation studies in these areas before potential sites are selected. The department also needs to purchase the necessary equipment and determine if personnel resources are available for these proposed sites.

5.6 NETWORK MODIFICATIONS FOR FY94

Table 7 lists the network modification goals for fiscal year 1994. There are 19 items on this list which details changes or modifications in the network. Major goals include installing continuous PM-10 monitors (TEOMs) at current county episodic air monitoring locations and overseeing the installation of two new industry operated SO_2 sites in Billings.

This list contains some of the items not completed in FY93. Carryover items include the establishment of two additional CO sites. The department needs to conduct saturation studies in these communities before potential sites are selected.

The department is also planning on adding a few PM-10 sites to its network. These sites are dependent on equipment availability and personnel resources. Proposed locations include Hamilton, Ashland, Clancy and Dillon. The department is also proposing changes to its lead monitoring network in East Helena.

The department plans to upgrade or replace equipment at several of its monitoring stations. These proposed purchases are listed as goals in Table 5. Additional purchases will be made through the year and equipment will be replaced as the state budget and EPA funding allows.

APPENDIX A: TABLES FOR NETWORK REVIEW

TABLE 1

MONTANA AMBIENT AIR MONITORING NETWORK

AIRS Number	Site Name/Address City/County	Parm	Year of Record	Station Type	Spatial Scale	Monitoring Objective*
	* H=high concentration, P=high population, S=source impact, B=background					
30-001-XXXX	Industrial Area Dillon/Beaverhead	PM-10	94	SLAMS	Neigh.	H,S
	This is a proposed PM-10 site near the industrial area south of Dillon. Depending on resources and equipment availability, the department might install a PM-10 sampler in this area.					
30-013-0009	Fire Station #1 Great Falls/Cascade	PM-10	88-93	SLAMS	Neigh.	H,P
	The department requested that a PM-10 monitor be located at this site since it recorded a TSP reading greater than 150 ug/m^3. The department also requested that the sampler be obtained from the Great Falls-Downtown site (Fire Station #1 considered maximum concentration site). Request was made in a letter dated 4-19-88. The department wrote a second letter on 5-19-88 requesting that the proposed sampler would be a Wedding rather than a Sierra-Anderson. The Sierra-Anderson sampler was intended for a site in Thompson Falls. EPA approved this request in a letter dated 12-12-88.					
	From 1989 through 1991, this site was collocated and ran on a 1-in-6 schedule with another PM-10 sampler. After the department assumed responsibility for the site, the collocated sampler was discontinued and the frequency increased to a 1-in-3 schedule beginning 11-1-92.					

30-013-1025 **Skyway Conoco** **CO** **89-93** **SLAMS** **Micro.** **H,P,S**
Great Falls/Cascade

The department requested that the Pardis Clinic CO monitor be moved to this location in order to locate a permanent microscale CO site (letter and form dated 8-16-89). EPA agreed with this change in a letter dated 11-2-89.

The January 1992 CO saturation study results indicated slightly higher CO levels a couple of blocks to the east of Skyway Cononco but the differences were not significant. An attempt was made to secure permission to move the site to the east but Cascade County could not get permission from the landowners. Therefore the Skyway Conoco site will remain where it is and there are no plans for a second CO site in Great Falls.

30-023-0010 **Teressa Ann Terrace** **PM-10** **89-92** **SPM** **Neigh.** **H,P**
Anaconda/Deer Lodge

This site was picked (by EPA) as a potential maximum concentration PM-10 site after an EPA/ESD official reviewed the site location during a visit to the state in June 1988. The department is not aware of any official request; however, the EPA approved the site location in a letter dated 12-12-88. As a formal follow-up, the department submitted a network modification request form documenting this site in a letter dated 6-6-89. EPA again approved the site in a letter dated 9-6-89. This time, however, the EPA had some concerns that the site may not represent the area of maximum concentration. The department wrote back on 10-12-89 with concern that EPA had already blessed the site and appeared to be back-pedaling. The department also asked for procedures to use to determine maximum concentration sites. EPA wrote back on 11-2-89 with suggested procedures. EPA staff intends to review the data to determine if the site is representative of a maximum concentration site (9-6-89 letter).

This site is operated by the ARCO Coal Company as part of their network around the Anaconda Superfund sites. The department receives this data and updates it to AIRS. This site also serve monitoring requirements for the Anaconda PM-10 Group II area.

More than two years of low readings warranted shut down of the site. The site was officially discontinued on September 30, 1992.

30-029-0003 **Col. Falls Jr. High** **PM-10** **85-93** **SLAMS** **Neigh.** **H,P**
Columbia Falls/
Flathead

TSP was discontinued at this site in September 1987 following the promulgation of the NAAQS for PM-10 on 7-31-87. PM-10 monitoring is being done at this site.

The department requested that the PM-10 monitor be discontinued at the Libby-Kendall Field site since special purpose monitoring had been discontinued. The sampler was moved to the Columbia Falls Junior High site to allow us to go to daily sampling (letter dated 3-3-88). EPA never responded to this request.

A network modification request form documenting this site was sent to EPA on 1-18-91. Since this was a documentation of an existing site and no proposed change, EPA did not respond. Another form was sent to the EPA in early 1992 requesting a reduced sampling frequency of 1-in-6 during the 2nd and 3rd quarters, and 1-in-2 during the 1st and 4th quarters. This request was approved and the new schedule began July 1, 1992.

30-029-0039 **Markus Foods** **PM-10** **91-93** **SLAMS** **Neigh.** **H,P**
Whitefish/Flathead

This PM-10 site started on April 30, 1991. This site is located in the central business district in Whitefish. The department decided to install this site due to public concern and Whitefish's proximity to other PM-10 non-attainment areas at Kalispell and Columbia Falls. Network modification request forms have been approved by the EPA.

Eight exceedances were measured by the department in February and March of 1992. Official non-attainment designation is expected to occur in October, 1993. To support the upcoming SIP, a source apportionment study is underway during the 1993 calendar year. The Markus Foods site operates on

a 1-in-1 and a 1-in-2 schedule during the 1st/4th, and 2nd/3rd quarters respectively. To verify the Markus Foods site as the maximum concentration site, a PM-10 saturation study was conducted during February, March, and April, 1993. The study confirms that the site is in the maximum concentration area.

30-029-0041 Patterson Corral PM-10 93 SPM Neigh. B
Whitefish/Flathead

This special purpose monitoring site was established to serve as the background site for the Whitefish chemical mass balance study. It is located approximately 1 1/2 miles directly east of Whitefish in an alfalfa field next to a corral. It consists of a single SA1200 sampler and runs on a 1-in-6 schedule. Site documentation forms have been submitted to and approved by the EPA.

30-029-1015 Universal Athletics PM-10 85-93 SLAMS Neigh. H,P
Kalispell/Flathead

TSP was discontinued at this site in September 1987 following the promulgation of the NAAQS for PM-10 on 7-31-87. PM-10 monitoring was also being done at this site.

A network modification request form documenting this site was sent to EPA on 1-18-91. Since this was a documentation of an existing site and no proposed change, EPA did not respond. Another form was sent to the EPA in early 1992 requesting a reduced sampling frequency of 1-in-2 during the 2nd and 3rd quarters. This request was approved and the new schedule began July 1, 1992.

30-029-XXXX	**Idaho and Main St. Kalispell/Flathead**	**CO**	**94**	**SLAMS**	**Micro.**	**H,P**

This is a new CO site being planned for the busy intersection of U.S Highway 93 and U.S. Highway 2 (Idaho Ave. & Main St.) in Kalispell. The exact location will be determined after further review. Network modification request forms will be sent to EPA for their approval. The probability of this site is dependent upon resources and equipment availability.

30-029-XXXX	**Courthouse East Kalispell/Flathead**	**PM-10**	**93**	**SPM**	**Neigh.**	**P**

This is a new site planned for the fall of 1993. It's main purpose is to collect PM-10 data with a high volume sampler to compare with PM-10 data collected with a continuous TEOM sampler.

30-031-0002	**East Main City Bldg. Bozeman/Gallatin**	**PM-10**	**85-93**	**SLAMS**	**Neigh.**	**H,P**

TSP was discontinued at this site in September 1987 following the promulgation of the NAAQS for PM-10 on 7-31-87. PM-10 monitoring is being done at this site.

The department installed a second PM-10 sampler at this site on January 11, 1991. This allowed us to increase sampling frequency from one-in-six days to every other day during the first and fourth quarters. Due to high TSP readings measured by the city of Bozeman and the need to obtain additional data in this fairly large Montana city, the department feels that increased sampling frequency was warranted. Network modification request forms have been approved by the EPA. The department intends to continue the status quo in the foreseeable future.

30-031-0008	**Belgrade ConAgra** **Belgrade/Gallatin**	**PM-10**	**91-93**	**SLAMS**	**Neigh.**	**H,P**

This PM-10 site was installed in an open field behind the Belgrade ConAgra elevators near residential areas. The first sample was taken on 10-9-91. Network modification request forms have been approved by the EPA.

The site currently operates on a 1-in-2 and 1-in-6 schedule during the 1st/4th, and 2nd/3rd quarters respectively. The department intends to continue the status quo in the foreseeable future.

30-043-0903	**Microwave** **Montana City/Jefferson**	**TSP**	**89-91**	**SLAMS**	**Neigh.**	**B,S**
		Pb	**89-91**	**SLAMS**	**Neigh.**	**B,S**
		SO_2	**74-93**	**SPM**	**Neigh.**	**S**

This is a fairly old site where the state and ASARCO measured TSP, Pb, and SO_2 over the years. After an absence, TSP and Pb were started up again on 11-6-89. The sampling frequency was initially every 1-in-6 days. On 7-1-90, the sampling frequency changed again to daily for a special source apportionment study until 3-31-91 when it went back to one-in-six. The department formally documented this site using the network modification request forms (letter and forms dated 6-27-90).

EPA approved this site as a SLAMS site in an undated letter (received 1-14-91). This site was operated as a background site for lead for the East Helena lead SIP. Since data needs have been met and concentrations are low, the department decided to terminate TSP and Pb at this site on 6-30-91. Network modification request forms were approved by the EPA and in a letter from the EPA responded in a letter dated August 14, 1991. They agreed to allow the department to shut down Microwave TSP and Pb. ASARCO continues to collect SO_2 data at this site.

30-043-0908 **Ash Grove Siding** SO_2 **89-93** **SPM** **Neigh.** **S**
Montana City/Jefferson

This site is operated by ASARCO and is part of their network around their primary lead smelter. The department formally documented this site using the network modification request forms (letter and forms dated 6-27-90).

EPA approved this site as a SLAMS equivalent special purpose monitor (SPM). in an undated letter (received 1-14-91). This site continues to operate.

30-043-0909 **Top of Microwave** SO_2 **93** **SPM** **Neigh.** **H,S**
Montana City/Jefferson

This is a new site operated by ASARCO. In 1992 dispersion modeling was performed as part of the SIP revisions. The modeling indicated that potentially high ambient SO_2 levels were occurring in the elevated terrain to the southwest of the smelter, in Jefferson County. As a result, the ambient SO_2 monitoring network was significantly revised in the spring of 1993. Once the SIP is approved and the control measures implemented, the SO_2 monitoring network will be reduced to only those sites necessary to adequately monitor the maximum SO_2 impact areas.

30-043-0910 **McClellan Creek Road#3** SO_2 **93** **SPM** **Neigh.** **H,S**
Montana City/Jefferson

This is a new site operated by ASARCO. In 1992, dispersion modeling was performed as part of the SIP revisions. The modeling indicated that potentially high ambient SO_2 levels were occurring in the elevated terrain to the southwest of the smelter, in Jefferson County. As a result, the ambient SO_2 monitoring network was significantly revised in the spring of 1993. Once the SIP is approved and the control measures implemented, the SO_2 monitoring network will be reduced to only those sites necessary to adequately monitor the maximum SO_2 impact areas.

30-043-0911	**McClellan Creek Road#4 Montana City/Jefferson**	SO_2	93	SPM	Neigh.	H,S

This is a new site operated by ASARCO. In 1992 dispersion modeling was performed as part of the SIP revisions. The modeling indicated that potentially high ambient SO_2 levels were occurring in the elevated terrain to the southwest of the smelter, in Jefferson County. As a result, the ambient SO_2 monitoring network was significantly revised in the spring of 1993. Once the SIP is approved and the control measures implemented, the SO_2 monitoring network will be reduced to only those sites necessary to adequately monitor the maximum SO_2 impact areas.

30-043-0912	**McClellan Creek Road#5 Montana City/Jefferson**	SO_2	93	SPM	Neigh.	H,S

This is a new site operated by ASARCO. In 1992 dispersion modeling was performed as part of the SIP revisions. The modeling indicated that potentially high ambient SO_2 levels were occurring in the elevated terrain to the southwest of the smelter, in Jefferson County. As a result, the ambient SO_2 monitoring network was significantly revised in the spring of 1993. Once the SIP is approved and the control measures implemented, the SO_2 monitoring network will be reduced to only those sites necessary to adequately monitor the maximum SO_2 impact areas.

30-043-0913	**McClellan Creek Road#6 Montana City/Jefferson**	SO_2	**93**	**SPM**	**Neigh.**	**H,S**

This is a new site operated by ASARCO. In 1992 dispersion modeling was performed as part of the SIP revisions. The modeling indicated that potentially high ambient SO_2 levels were occurring in the elevated terrain to the southwest of the smelter, in Jefferson County. As a result, the ambient SO_2 monitoring network was significantly revised in the spring of 1993. Once the SIP is approved and the control measures implemented, the SO_2 monitoring network will be reduced to only those sites necessary to adequately monitor the maximum SO_2 impact areas.

30-043-0914	McClellan Creek Road#7 Montana City/Jefferson	SO_2	93	SPM	Neigh.	H,S

This is a new site operated by ASARCO. In 1992 dispersion modeling was performed as part of the SIP revisions. The modeling indicated that potentially high ambient SO_2 levels were occurring in the elevated terrain to the southwest of the smelter, in Jefferson County. As a result, the ambient SO_2 monitoring network was significantly revised in the spring of 1993. Once the SIP is approved and the control measures implemented, the SO_2 monitoring network will be reduced to only those sites necessary to adequately monitor the maximum SO_2 impact areas.

30-043-0915	McClellan Creek Road#8 Montana City/Jefferson	SO_2	93	SPM	Neigh.	H,S

This is a new site operated by ASARCO. In 1992 dispersion modeling was performed as part of the SIP revisions. The modeling indicated that potentially high ambient SO_2 levels were occurring in the elevated terrain to the southwest of the smelter, in Jefferson County. As a result, the ambient SO_2 monitoring network was significantly revised in the spring of 1993. Once the SIP is approved and the control measures implemented, the SO_2 monitoring network will be reduced to only those sites necessary to adequately monitor the maximum SO_2 impact areas.

30-043-0916	McClellan Creek Road#9 Montana City/Jefferson	SO_2	93	SPM	Neigh.	H,S

This is a new site operated by ASARCO. In 1992, dispersion modeling was performed as part of the SIP revisions. The modeling indicated that potentially high ambient SO_2 levels were occurring in the elevated terrain to the southwest of the smelter, in Jefferson County. As a result, the ambient SO_2 monitoring network was significantly revised in the spring of 1993. Once the SIP is approved and the control measures implemented, the SO_2 monitoring network will be reduced to only those sites necessary to adequately monitor the maximum SO_2 impact areas.

30-043-XXXX	Clancy Area Clancy/Jefferson	PM-10	94	SLAMS	Neigh.	H,P

This is a rapidly growing residential area southeast of Helena. This is a proposed PM-10 site for the north part of Jefferson County. There are several paved and unpaved roads in the area as well as residential wood combustion.

30-049-0001	Cogswell Building Helena/Lewis & Clark	PM-10	85-93	SLAMS	Neigh.	P

TSP was discontinued at this site in September 1987 following the promulgation of the NAAQS for PM-10 on 7-31-87. PM-10 monitoring was also being done at this site.

The department requested that the collocated PM-10 monitor located at this site be moved to the Butte-Greeley School site because it has higher readings (letter dated 10-11-89). EPA approved this move in a letter dated 11-17-89.

The department made a request to EPA on 11-14-90 to reduce the sampling frequency from every other day to once every six days starting 10-1-90. The concentrations observed at this site warrant this change in sampling frequency. The EPA approved this request in a letter dated 12-3-90. Historically, the particulate concentrations measured at the Cogswell Building have been consistently low.

30-049-0018	Lincoln School Helena/Lewis & Clark	PM-10	91-93	SLAMS	Neigh.	H,P

This is an existing site that has been operated by the Lewis & Clark County Health Department during their winter-time wood stove curtailment program. This site was originally operated as an SPM and was used to help call the county alerts, but the county now relies on the continuous PM-10 analyzer for this purpose. The nephelometer used for the alert program was replaced with a TEOM and data from this instrument will be reported to AIRS beginning 10/1/93. This site was designated a SLAMS site on October 1, 1991.

30-049-0701 **Kleffner Road** **SO_2** **74-93** **SPM** **Neigh.** **H,S**
East Helena/Lewis & Clark

This site is operated by ASARCO and is part of their network around their primary lead smelter. The department formally documented this site using the network modification request forms (letter and forms dated 6-27-90).

EPA approved this site as a SLAMS equivalent special purpose monitor (SPM). in an undated letter (received 1-14-91). This site continues to operate.

30-049-0702 **Water Tank** **SO_2** **74-93** **SPM** **Neigh.** **H,S**
East Helena/Lewis & Clark

This site is operated by ASARCO and is part of their network around their primary lead smelter. The department formally documented this site using the network modification request forms (letter and forms dated 6-27-90).

EPA approved this site as a SLAMS equivalent special purpose monitor (SPM). in an undated letter (received 1-14-91). This site continues to operate.

30-049-0703 **Kennedy Park** **SO_2** **74-93** **SPM** **Neigh.** **H,S**
East Helena/Lewis & Clark

This site is operated by ASARCO and is part of their network around their primary lead smelter. The department formally documented this site using the network modification request forms (letter and forms dated 6-27-90).

EPA approved this site as a SLAMS equivalent special purpose monitor (SPM). in an undated letter (received 1-14-91). This site continues to operate.

30-049-0711	**East Station East Helena/Lewis & Clark**	**SO_2**	**74-92**	**SPM**	**Neigh.**	**H,S**

This site is operated by ASARCO and is part of their network around their primary lead smelter. The department formally documented this site using the network modification request forms (letter and forms dated 6-27-90). EPA approved this site as a SLAMS equivalent special purpose monitor (SPM) in an undated letter (received 1-14-91).

This site was shut down on 6-30-92 as part of the revision to the ASARCO SO_2 monitoring network.

30-049-0714	**Firehall East Helena/Lewis & Clark**	**TSP**	**81-93**	**SLAMS**	**Neigh.**	**H,P,S**
		Pb	**81-93**	**SLAMS**	**Micro.**	**H,P,S**

The department requested that the sampling frequency be changed from one-in-three days to one-in-six days in a letter dated 6-7-89. The EPA approved this request on 7-17-89. On 7-1-90, the sampling frequency changed again to daily for a special source apportionment study until 3-31-91 when it will go to every other day.

The department requested using quartz filters at this site so they could be analyzed using XRF for the continuance of a CMB study under the East Helena lead SIP (letter dated 8-9-90). EPA initially nixed the request in a letter dated 8-30-89. A second request for use of quartz filters was made by the department on 11-14-89. This time EPA approved the request in letters dated 12-27-89 and 1-3-90. Use of these filters were limited to the length of the CMB study.

In a letter to EPA dated 5-31-91, the department requested the following: (1) Reduce frequency to every other day starting 4-1-91, (2) change back to fiberglass filters starting 7-1-91, and (3) relocate the collocated sampler from Hadfield to Firehall starting 7-1-91.

EPA responded in a letter dated August 14, 1991. They agreed with all of our requests for this site but the relocation of the Hadfield collocated sampler depended on the termination of that site. They did not agree with that request. Consequently, the department will not move the collocated sampler to Firehall. As per the request, the department began operating the site on a 1-in-2 schedule and will continue operation at this frequency.

30-049-0719	**Hadfield East Helena/Lewis & Clark**	**TSP**	**81-93**	**SLAMS**	**Neigh.**	**H,P,S**
		Pb	**81-93**	**SLAMS**	**Micro.**	**H,P,S**
		PM-10	**88-93**	**SLAMS**	**Neigh.**	**H,P**

The department requested that the sampling frequency be changed for the TSP/Pb sampler from one-in-three days to one-in-six days in a letter dated 6-7-89. The EPA approved this request on 7-17-89.

The department requested using quartz filters at this site so they could be analyzed using XRF for the continuance of a CMB study under the East Helena lead SIP (letter dated 8-9-90). EPA initially nixed the request in a letter dated 8-30-89. A second request for use of quartz filters was made by the department on 11-14-89. This time EPA approved the request in letters dated 12-27-89 and 1-3-90. Use of these filters were limited to the length of the CMB study.

East Helena was considered part of the Helena PM-10 Group II area. After the PM-10 standard was promulgated, TSP samplers were run as surrogates at this location. In April 1988, the site recorded a TSP reading greater than 150 ug/m^3. This event triggered the department into installing a PM-10 sampler. The actual samplers were purchased by industry but data is analyzed and reported by the state.

In a letter to EPA dated 5-31-91, the department requested the following: (1) Shutdown the TSP/Pb samplers on 7-1-91, (2) relocate the collocated sampler from this site to Firehall starting 7-1-91, (3) keep the PM-10 sampler at its present location and (4) discontinue lead analyses on PM-10 filters.

EPA responded in a letter dated August 14, 1991. They disagreed with our request to shut down the Hadfield TSP/Pb sampler. They wanted the department to operate the sampler on a one-in-six day schedule. They allowed us to discontinue the lead analysis on PM-10 filters. They agreed to allow us move the collocated sampler to Firehall but the department will not do this since the TSP/Pb monitors are not being terminated. EPA cited a SIP provision in a 1984 Federal Register notice that committed the state to continue TSP/Pb sampling at this site indefinitely.

In a 2/10/93 letter to EPA, the department requested shutdown of the Hadfield PM-10 site. This request was approved in a 3/30/93 letter and the site was discontinued effective April 1, 1993.

It is expected that when consensus is reached with regard to the Pb dispersion modeling, the Hadfield TSP site will be discontinued and a new site will be installed at the modeled maximum Pb concentration site (expected to be near Prickly Pear Creek on Pacific Street).

30-049-0724	**Dartman Field East Helena/Lewis & Clark**	**TSP**	**83-93**	**SLAMS**	**Neigh.**	**H,S**
		Pb	**83-93**	**SLAMS**	**Neigh.**	**H,S**

This site has been operated as a TSP/Pb site since 1983. This site was moved about 125 yards to the east on 6-28-90 to be located near ASARCO's Kennedy Park meteorological monitor. This change was verbally communicated to EPA and received approval prior to the move. The department formally documented this move and the site using the network modification request forms (letter and forms dated 6-27-90). As of September 1990, EPA has not responded to the documentation.

The department operated a PM-10 sampler at this site from 1987 until 1989. Lead analyses were conducted on the PM-10 filters and compared with the lead on the TSP filters. The PM-10 concentrations were very low and the sampler was needed in Columbia Falls so that daily sampling could be

conducted at that site. PM-10 sampling was being done at another site in East Helena. Consequently, PM-10 was discontinued at this site on 10-2-89. EPA was not formally notified of this change.

In a letter to EPA dated 5-31-91, the department requested the following: (1) Reduce frequency to one-in-six days starting 4-1-91 and (2) shutdown the TSP/Pb samplers on 7-1-91.

EPA responded in a letter dated August 14, 1991. They agreed with our request to reduce the frequency to once every sixth day but disagreed with our request to shut down the site. The site has operated on a 1-in-6 schedule since 4-1-91 and will continue to operate at that frequency.

30-049-0726	**Old Railroad East Helena/Lewis & Clark**	**TSP**	**89-93**	**SLAMS**	**Neigh.**	**H,S**
		Pb	**89-93**	**SLAMS**	**Neigh.**	**H,S**

This site is located to the east of the Asarco smelter. The TSP and Pb were started up on 11-6-89. The sampling frequency initially was every 1-in-6 days. On 7-1-90, the sampling frequency changed again to daily for a special source apportionment study until 3-31-91 when it went back to every other day. The department formally documented this site using the network modification request forms (letter and forms dated 6-27-90).

EPA approved this site as a SLAMS site in an undated letter (received 1-14-91). In a letter to EPA dated 5-31-91, the department requested the following: (1) Reduce frequency to every other day starting 4-1-91 and (2) move the sampler to a new maximum concentration site as determined by dispersion modeling.

EPA responded in a letter dated August 14, 1991. They agreed with our request to reduce the frequency to every other day. They also agreed with our request to move the site to a maximum concentration site as determined by dispersion modeling. Another network modification request form will need to be submitted detailing this request.

In a letter dated January 30, 1992, the department requested that the sampling frequency be reduced to a 1-in-6 frequency. The request came as a result of the site being used by ASARCO for superfund purposes. This request was approved by the EPA in a 4-3-92 letter. Because of an occasional high reading at this site, and contrary to earlier intentions, it has been agreed that the Old Railroad site will continue to operate and the Hadfield site will be relocated to the maximum concentration site.

30-049-XXXX	**Prickly Pear Creek E. Helena/Lewis and Clark County**	**TSP**	**93**	**SLAMS**	**Neigh**	**H,P,S**
		Pb	**93**	**SLAMS**	**Neigh**	**H,P,S**

This is the proposed maximum concentration TSP/Pb site located directly north of the ASARCO smelter and across Highway 12 on Prickly Pear Creek. There was some disagreement between the EPA and ASARCO regarding the modeling results, but it appears that the site will be located here. When this site begins operation, in the fall of 1993, the Hadfield TSP/Pb site will be discontinued.

30-053-0012	**Lincoln Co. Courthouse Libby/Lincoln**	**PM-10**	**85-93**	**SLAMS**	**Neigh.**	**H,P**

TSP was discontinued at this site in September 1987 following the promulgation of the NAAQS for PM-10 on 7-31-87. A network modification request form documenting this site was sent to EPA on 1-18-91. Since this was a documentation of an existing site and no proposed change, EPA did not respond.

Due to the high 24-hour readings at this site and a ratio of the maximum concentration to the standard greater than 1.4, this site qualified for a sampling frequency of only once every six days. The department requested a reduced sampling frequency of 1-in-2 and 1-in-6 during the 1st/ 4th, and

2nd/3rd quarters, respectively. This request was approved by EPA and went into effect on July 1, 1992. The nephelometer, used for the mandatory wood smoke curtailment program, is expected to be replaced with a TEOM PM-10 sampler in October, 1993.

30-053-0019 Troy School PM-10 91-93 SLAMS Neigh. H,P
Troy/Lincoln

This is a new PM-10 site that was installed at the Troy School in September, 1991. The site operates every other day during the first and fourth quarters and once every six days during the other quarters. A network modification request form has been approved by the EPA. Concentrations thus far have been low. If concentrations remain low after another winter of sampling, the department may request to discontinue this site.

30-053-1005 Lincoln Electric Co-Op PM-10 87-92 SLAMS Neigh. H,P
Eureka/Lincoln

TSP monitoring was discontinued at this site in October 1987 and PM-10 sampling was switched over to PM-10. Because of the consistently low readings over a 5 year period, the department requested that the EPA approve termination of the site. This request was approved and the site was discontinued after June 30, 1992.

30-063-0005 Malfunction Junction CO 79-93 SLAMS Neigh. H,P,S
Missoula/Missoula

The department and the Missoula City-County Health Department requested that this site be discontinued during the five summer months from April 1 through August 30 due to a concern about resources and the lack of elevated CO readings during this period (letter and attached form dated 4-6-90). EPA approved this request in a letter dated 6-29-90 for the specified

period in 1990 but not necessarily for other years. Comments were made concerning relocation of the CO probe and need for eight consecutive quarters of data for attainment/maintenance demonstrations.

In letter and forms dated 5-16-91, the department requested that the Malfunction site be seasonally shutdown from May 1, 1991 to August 31, 1991. The department anticipated that an oxygenated fuel program will be part of the CO SIP for Missoula. When the oxygenated fuel program starts the department will conduct continuous monitoring to show eight quarters of compliance data.

EPA responded to this request in a letter dated August 8, 1991. They approved this request but noted that eight consecutive quarters of data without a violation must be presented to show attainment. Use of seasonal data to show attainment is not acceptable.

The oxygenated fuels program started on October 1, 1992. A CO saturation study was conducted in December, 1992. The results conclusively demonstrated, and EPA agreed, that the Malfunction Junction site is the maximum CO site in Missoula. The site will collect data continuously to support a future redesignation request and there are no plans for a second CO monitoring site in Missoula.

30-063-0016	**Stone #2 Missoula/Missoula**	**TSP**	**77-92**	**SPM**	**Neigh.**	**S**
		PM-10	**92-93**	**SPM**	**Neigh.**	**S**

This site is operated jointly by Missoula County and Stone Container Corporation. The TSP sampler was used as a surrogate PM-10 sampler.

The department requested that Stone Container replace or upgrade the existing TSP monitors to PM-10s. This was done and PM-10 sampling began on 5-18-92.

30-063-0024	**Boyd Park Missoula/Missoula**	**PM-10**	**84-93**	**SLAMS**	**Neigh.**	**H,P**
		CO	**81-91**	**SLAMS**	**Neigh.**	**P**

TSP was discontinued at this site in September 1987 following the promulgation of the NAAQS for PM-10 on 7-31-87. PM-10 sampling began on 1-1-84. A network modification request form documenting this site was sent to EPA on 1-18-91. Since this was a documentation of an existing site and no proposed change, EPA did not respond.

The PM-10 site now operates on a 1-in-6 and a 1-in-2 schedule during the 2nd/3rd and 1st/4th quarters respectively. Also, at Missoula County's request, the department has assumed responsibility for filter processing.

In letter and forms dated 5-16-91, the department requested that the Boyd Park CO site be permanently shutdown starting April 1, 1991.
EPA responded to this request in a letter dated August 8, 1991. They disapproved the request to permanently shut down the site. They noted the need for additional justification. They wanted to know that 1) Malfunction Junction is the CO maximum concentration location and 2) that there is no need for a second CO monitoring site in Missoula (i.e., that the Malfunction Junction site can adequately address all contributing sources whether they are mobile, point or area).

The department provided EPA with additional justification in a letter dated September 16, 1991. EPA then agreed to the Boyd Park shut down request in a letter dated October 4, 1991. The Boyd Park CO analyzer was never re-started since it had been shut down for the summer season on April 1, 1991. A CO saturation study conducted in December, 1992 confirmed that the Malfunction Junction site is the maximum CO location in Missoula.

30-063-0031	**Health Dept. Roof Missoula/Missoula**	**PM-10**	**86-93**	**SLAMS**	**Neigh.**	**H,P**

TSP was discontinued at this site in September 1987 following the promulgation of the NAAQS for PM-10 on 7-31-87. PM-10 sampling was initiated in September 1986. This site is in the downtown central business districts and is considered a maximum concentration site for this part of Missoula. A network modification request form documenting this site was sent to EPA on 1-18-91. Since this was a documentation of an existing site and no proposed change, EPA did not respond.

The site now operates on a 1-in-6 and a 1-in-2 schedule during the 2nd/3rd and 1st/4th quarters respectively. Also, at Missoula County's request, the department has assumed responsibility of filter processing.

30-063-0034	**Stone #1A Missoula/Missoula**	**TSP**	**87-92**	**SPM**	**Neigh.**	**S**
		NO_2	**88-92**	**SPM**	**Neigh.**	**H,S**
		PM-10	**92-93**	**SPM**	**Neigh.**	**S**

The particulate sampler is operated jointly by Missoula County and Stone Container Corporation. The TSP sampler was used as a surrogate PM-10 sampler. The TSP sampler was moved to this site from the Stone #1 site because it was in more of a direct line downwind of the facility.

NO_2 was being monitored by the Stone Container Corporation as a condition of a permit to burn petroleum coke in their lime kilns. Due to low ambient concentrations and because only one kiln was converted the monitoring was discontinued on June 1, 1992. The NO_2 monitoring will resume if additional kilns are converted to coke.

The department requested that Stone Container replace or upgrade the existing TSP monitors to PM-10s. This was done and PM-10 sampling began on 5-18-92.

30-087-0700	**MPC #3 Colstrip/Rosebud**	**SO_2**	**82-93**	**SPM**	**Neigh.**	**H,P**
		NO_2	**82-93**	**SPM**	**Neigh.**	**H,S**
		PM-10	**89-93**	**SPM**	**Neigh.**	**H,P**

This site is operated by the Montana Power Company and is part of their network around their coal-fired power plants. This site is intended to monitor for PM-10 in the Colstrip TSP secondary non-attainment area. The PM-10 sampler was installed and began operation in December, 1989.

30-087-0701	**MPC #1 Colstrip/Rosebud**	**TSP**	**72-92**	**SPM**	**Neigh.**	**H,S**
		SO_2	**81-93**	**SPM**	**Neigh.**	**H,S**
		NO_2	**81-93**	**SPM**	**Neigh.**	**H,S**
		PM-10	**92-93**	**SPM**	**Neigh.**	**H,S**

This site is operated by the Montana Power Company and is part of their network around their coal-fired power plants.

TSP sampling was discontinued on 6-30-92 and PM-10 sampling began on 7-2-92.

30-087-0702	**MPC #2 Colstrip/Rosebud**	**TSP**	**72-92**	**SPM**	**Neigh.**	**H,S**
		SO_2	**81-93**	**SPM**	**Neigh.**	**H,S**
		NO_2	**81-93**	**SPM**	**Neigh.**	**H,S**
		PM-10	**92-93**	**SPM**	**Neigh.**	**H,S**

This site is operated by the Montana Power Company and is part of their network around their coal-fired power plants.

TSP sampling was discontinued on 6-30-92 and PM-10 sampling began on 7-2-93.

30-087-0704	**MPC #4 Colstrip/Rosebud**	**TSP**	**77-92**	**SPM**	**Neigh.**	**H,S**
		SO_2	**77-92**	**SPM**	**Neigh.**	**H,S**
		NO_2	**77-92**	**SPM**	**Neigh.**	**H,S**

This site is operated by the Montana Power Company and is part of their network around their coal-fired power plants.

A review of the ambient data revealed that the other MPC sites adequately monitored the ambient impacts from the Colstrip units. As a result the department allowed MPC to terminate this site on June 30, 1992. EPA approved this action in a letter dated April 3, 1992.

30-087-XXXX	**Ashland Area Ashland/Rosebud**	**PM-10**	**94**	**SLAMS**	**Neigh.**	**H,P**

This is a new PM-10 site proposed for the town of Ashland. This is a small town on the edge of the Northern Cheyenne Indian Reservation. Sources in this town include a small sawmill, paved and unpaved roads and residential wood combustion.

30-089-0003	**Sanders Co. Courthouse Thompson Falls/Sanders**	**PM-10**	**85-93**	**SLAMS**	**Neigh.**	**H,P**

The department requested that a Sierra-Anderson PM-10 sampler from Great Falls be moved to this site in order to increase sampling frequency (letter

dated 5-19-88). EPA approved this move in a letter dated 12-12-88. A network modification request form documenting this site was sent to EPA on 1-18-91. Since this was a documentation of an existing site and no proposed change, EPA did not respond.

The department requested that the sampling frequency be changed from an every day sampling schedule to a 1-in-6 and a 1-in-2 schedule during the 2nd/3rd and 1st/4th quarters respectively. This request was approved and the schedule went into effect on 7-1-92.

30-093-0005 Greeley School PM-10 85-93 SLAMS Neigh. H,P,S
Butte/Silver Bow

The department requested that the PM-10 samplers be moved from the top of the school building to the top of a sampling shelter to lower the probe height (letter dated 3-22-88). EPA approved the relocation in a letter dated 12-12-88. To formalize the request the department submitted a network modification request form for this change on 8-10-89. EPA again approved this change in a letter dated 11-2-89.

The department requested that the collocated PM-10 monitor located at the Helena-Cogswell Building be moved to the Butte-Greeley School site because Butte has higher PM-10 readings (letter dated 10-11-89). EPA approved this move in a letter dated 11-17-89.

The department requested that the sampling frequency be changed from an every day sampling schedule to a 1-in-6 and a 1-in-2 schedule during the 2nd/3rd and 1st/4th quarters respectively. This request was approved and the schedule went into effect on 7-1-92. The nephelometer, used for the mandatory wood smoke curtailment program, was replaced with a TEOM in August, 1993 and will begin reporting data to AIRS beginning 10-1-93.

30-093-0008	**Butte - Greenhouse** **Butte/Silver Bow**	**PM-10**	**91-92**	**SLAMS**	**Neigh.**	**H,P**

This PM-10 site was installed in the maximum emission grid in the Butte PM-10 Group I area. The first sample was taken on 1-5-91. The additional site was needed to show attainment and maintenance of the PM-10 standard in this part of Butte. A letter and a network modification request form was sent to EPA on 1-18-91. EPA approved this site in a letter dated 2-13-91. The samplers will operate every other day during the first and fourth quarters and every sixth day during the second and third quarters.

In a letter dated 5-27-93, the department requested that the Butte Greenhouse site be shut down based on the consistently lower readings than those measured at the Butte Greeley site. This was approved and the site was discontinued on 7-1-92.

30-093-XXXX	**Harrison & Int. 90** **Butte/Silver Bow**	**CO**	**94**	**SLAMS**	**Micro.**	**H,P**

This is a new CO site being planned for the busy intersection of Interstate 90 and Harrison Avenue in Butte. Exact location will be determined. Network modification request forms will be sent to EPA for their approval. The establishment of this site is dependent upon resources and equipment availability.

30-111-0008	**City Hall** **Billings/Yellowstone**	**TSP**	**71-91**	**SLAMS**	**Neigh.**	**H,P**

The department recommended that this site be shutdown by December 31, 1991. The YCAPC's PM-10 sampler was located about three blocks east and is considered in the maximum concentration site for the area. Formal network modification request forms were sent to the EPA requesting approval for this change. The request was approved and the site was discontinued on 12-31-91.

30-111-0016	**BLAQTC - Laurel** **Laurel/Yellowstone**	**SO_2**	**87-93**	**SPM**	**Neigh.**	**H,S**

This is a BLAQTC (industrial) site that has been operated by the companies since 12-87. The department formally documented the site using the network modification request forms (letter and forms dated 1-5-90). EPA approved the site on 5-14-90 as a SLAMS equivalent special purpose monitor (SPM).

30-111-0066	**Coburn Road** **Billings/Yellowstone**	**SO_2**	**81-93**	**SLAMS**	**Neigh.**	**H,S**

This is a state site that has continuously operated since 1981. The department formally documented the site using the network modification request forms (letter and forms dated 1-5-90). EPA approved the site on 5-14-90 as a SLAMS. EPA was concerned about the height of the meteorological monitors particularly if they were to be used for SIP purposes.The department upgraded the meteorological sensor on 11-14-90. This involved erecting a 10 meter tower across the fence and away from the sampling trailer.

In an attempt to reduce vandalism, the Ponderosa monitoring shelter was moved to the Coburn Road location, approximately 30 feet west of the existing air monitoring trailer and the instruments in the original Coburn Road trailer were moved to the new (i.e. old Ponderosa) shelter on 10-1-92. A letter, along with photographs, documenting the move was sent to EPA on 10-29-92.

30-111-0075	**Metra - 4th & Expo** **Billings/Yellowstone**	**CO**	**88-92**	**SLAMS**	**Micro.**	**H**

This was the second microscale CO site that was located along Main Street (Exposition Drive). The approval process for this site was a fairly lengthy procedure since EPA was concurrently developing internal network approval procedures with their agency. The department submitted information in support of this site but EPA's network modification request

form had not been developed at this time. The EPA approved this site in their 12-12-88 letter. The approval was conditional on the need for the department to conduct a CO grab sampling study in Billings. The intent of the study was to determine if this site would be considered the maximum concentration site and coupled with the need to show attainment/maintenance of the CO NAAQS at all locations in Billings.

The Yellowstone County Air Pollution Control conducted CO grab sampling studies during the winters of 1988-89 and 1989-90, and a CO saturation study in December of 1991. The last study identified two maximum CO concentration areas; the rapidly growing west side along 24th Street West and the downtown business district along North 27th Street. As a result of the EPA-approved saturation study the department and the Yellowstone County Air Pollution Control program installed two new CO monitoring sites in Billings during the fall of 1992 and terminated the Metra CO monitoring site on November 16, 1992.

30-111-0076 Ponderosa School SO_2 89-92 SLAMS Neigh. P
Billings/Yellowstone

This has been a state operated site since 10-6-89. The purpose of this site is to measure SO_2 in a populated area. The department formally documented the site using the network modification request forms (letter and forms dated 1-5-90). EPA approved the site on 5-14-90 as a SLAMS. EPA was concerned about the height of the meteorological monitors particularly if they were to be used for SIP purposes.

On June 30, 1992 the Ponderosa School site was shut down due to low readings and the outcome of two dispersion modeling studies (one in support of a permit application for a PSD co-generation facility and another by the city of Billings). This action was approved by EPA in a letter dated 6-22-92. The Ponderosa monitoring shelter was moved to the Coburn Road location.

30-111-0077	**Federal Credit Union Billings/Yellowstone**	**PM-10**	**89-92**	**SLAMS**	**Micro.**	**H,P**

This PM-10 sampler was installed in November 1989. This site is intended to monitor for PM-10 in Billings TSP secondary non-attainment area.

The YCAPC operated this site with the collocated sampler on a one-in-six day schedule until December 31, 1991. Starting on January 1, 1992, YCAPC began operating the PM-10 site on a one-in-three days sampling schedule using a single sampler (no collocated sampling) until the site was shut down on 8/4/92. The site was shut down because of security concerns and the samplers were moved to the Diamond Parking site.

30-111-0078	**Diamond Parking Billings/Yellowstone**	**PM-10**	**92-93**	**SLAMS**	**Micro.**	**H,P**
		CO	**92-93**	**SLAMS**	**Micro**	**H,P**

The PM-10 samplers from the Federal Credit Union site were moved one block west after security reasons forced the relocation. As with the Federal Credit Union site, this site is located to serve as the maximum concentration PM-10 site in Billings. It now operates on a 1-in-3 schedule.

In order to show attainment and maintenance of the standard at all locations, Yellowstone County Air Pollution Control conducted a CO saturation study in December of 1991. The study identified two maximum CO concentration areas; the rapidly growing west side along 24th Street West and the downtown business district along North 27th Street. As a result of the EPA-approved saturation study, the department and YCAPC installed a new CO monitoring site (Diamond Parking) located on North 27th Street, between 3rd & 4th Avenues. It began operation in November of 1992 and was approved by EPA in a letter dated April 2, 1993. The monitor will be kept at the current location and an attempt will be made to collect 8 consecutive quarters of data at the site.

30-111-0079	**Mount Olive** **Billings/Yellowstone**	**CO**	**92-93**	**SLAMS**	**Micro.**	**H,P**

In order to show attainment and maintenance of the standard at all locations, Yellowstone County Air Pollution Control conducted a CO saturation study in December of 1991. The study identified two maximum CO concentration areas; the rapidly growing west side along 24th Street West and the downtown business district along North 27th Street. As a result of the EPA-approved saturation study the department and YCAPC installed a new CO monitoring site (Mount Olive) located on 24th Street West just north of Central Avenue. It began operation in November of 1992 and was approved by EPA in a letter dated February 5, 1993. Since the area is currently non-attainment for CO an attainment demonstration still needs to be made. Therefore, this monitor and the one at Diamond Parking will be kept at their current locations and an attempt will be made to collect 8 consecutive quarters of data at the two sites.

30-111-0080	**Sacrifice Cliff** **Billings/Yellowstone**	**SO_2**	**93**	**SLAMS**	**Neigh.**	**H,S**

In 1990, EPA hired a contractor to develop an SO_2 emission inventory for the Billings-Lockwood-Laurel area. The final report was submitted during February, 1991. Also in 1990, the City of Billings hired a contractor to perform a dispersion modeling study for the Billings-Laurel-Lockwood area utilizing recently gathered meteorological data and the updated emission inventory. The preliminary results of the dispersion modeling study indicated that potential violations of the SO_2 NAAQS existed using allowable emission rates as well as at actual emission levels. In some cases the model predicted high SO_2 concentrations in areas where air monitoring had never been conducted. In July, 1990 Billings Generation,Inc. (BGI) applied for a permit to construct a coke-fired, power generation facility. Dispersion modeling by BGI indicated elevated SO_2 levels in the Lockwood area. The department reviewed and refined the results of the modeling studies and concluded that additional SO_2 monitoring sites were needed at the modeled SO_2 "hot-spots".

At the location of the modeled maximum SO_2 "hot-spot" the department installed an SO_2 monitor. The site was named Sacrifice Cliff and data collection started on May 19, 1993. The department submitted a network modification form to EPA on May 24, 1993 requesting approval of this site; EPA has not responded to date.

30-111-1001 Laurel Jr. High Sch. TSP 71-91 SLAMS Neigh. P
Billings/Yellowstone

The department recommended that this site be shutdown by December 31, 1991. Concentrations measured at this site were low over the monitoring period. Formal network modification request forms were sent to the EPA requesting approval for this change. The request was approved and the site was discontinued on 12-31-91.

30-111-1065 BLAQTC - Lockwood Park SO_2 87-93 SPM Neigh. H,P,S
Billings/Yellowstone

This is a BLAQTC (industrial) site that has been operated by the companies since 12-87. This site is located in the same area as the department's old Lockwood Park site (30-111-0065); that site operated from 1981 until 1-87. The department formally documented the site using the network modification request forms (letter and forms dated 1-5-90). EPA approved the site on 5-14-90 as a SLAMS equivalent special purpose monitor (SPM).

30-111-2005 BLAQTC - Brickyard Lane SO_2 89-93 SPM Neigh. H,P,S
Billings/Yellowstone

This is a BLAQTC (industrial) site that has been operated by the companies since 11-8-89. The department formally documented the site using the network modification request forms (letter and forms dated 1-5-90). EPA approved the site on 5-14-90 as a SLAMS equivalent special purpose monitor (SPM).

As a result of two dispersion modeling studies conducted in the Billings area in 1991 and 1992, there is a possibility that this site may be relocated to the Billings Heights area. Discussions between EPA, BLAQTC and the department should resolve the issue by the spring of 1994.

30-111-XXXX **BGI-South Johnson Lane** SO_2 **93** **SPM** **Neigh.** **H,P,S**
Billings/Yellowstone

In July, 1990 Billings Generation,Inc. (BGI) applied for a permit to construct a coke-fired, power generation facility adjacent to and utilizing petroleum coke from the Exxon refinery. Dispersion modeling by BGI, required as part of the permitting process, indicated elevated SO_2 levels in the Lockwood area. The department reviewed and refined the results of the modeling studies and concluded that additional SO_2 monitoring sites were needed.

As a result of the permitting process, BGI will install and operate SO_2 monitors at two modeled "hot-spots". One site, scheduled for start-up in October, 1993, will be near Johnson Lane, south of I-90, and east of the existing Lockwood Park site.

30-111-XXXX **BGI-Pine Hills School** SO_2 **93** **SPM** **Neigh.** **H,P,S**
Billings/Yellowstone

In July, 1990 Billings Generation,Inc. (BGI) applied for a permit to construct a coke-fired, power generation facility adjacent to and utilizing petroleum coke from the Exxon refinery. Dispersion modeling by BGI, required as part of the permitting process, indicated elevated SO_2 levels in the Lockwood area. The department reviewed and refined the results of the modeling studies and concluded that additional SO_2 monitoring sites were needed.

As a result of the permitting process, BGI will install and operate SO_2 monitors at two modeled "hot-spots". One site, scheduled for start-up in the fall of 1993, will be east of the I-90/I-94 junction, in the elevated terrain near the Pine Hill School.

TABLE 2

MONTANA AMBIENT AIR MONITORING NETWORK (SHORT LIST)

AIRS Number	Site Name/Address City/County	Parm	Year of Record	Station Type	Spatial Scale	Monitoring Objective*
	* H=high concentration, P=high population, S=source impact, B=background					
30-001-XXXX Proposed Site	Industrial Area Dillon/Beaverhead	PM-10	94	SLAMS	Neigh.	H,S
30-013-0009	Fire Station #1 Great Falls/Cascade	PM-10	88-93	SLAMS	Neigh.	H,P
30-013-1025	Skyway Conoco Great Falls/Cascade	CO	89-93	SLAMS	Micro.	H,P,S
30-029-0003	Col. Falls Jr. High Columbia Falls/ Flathead	PM-10	85-93	SLAMS	Neigh.	H,P
30-029-1015	Universal Athletics Kalispell/Flathead	PM-10	85-93	SLAMS	Neigh.	H,P
30-029-0039	Markus Foods Whitefish/Flathead	PM-10	91-93	SLAMS	Neigh.	H,P
30-029-0041	Patterson Corral Whitefish/Flathead	PM-10	93	SPM	Neigh.	B
30-029-XXXX Proposed Site	Idaho and Main St. Kalispell/Flathead	CO	94	SLAMS	Micro.	H,P
30-029-XXXX Proposed Site	Courthouse East Kalispell/Flathead	PM-10	93	SPM	Neigh.	P
30-031-0002	East Main City Bldg. Bozeman/Gallatin	PM-10	85-93	SLAMS	Neigh.	H,P

30-031-0008	Belgrade ConAgra Belgrade/Gallatin	PM-10	91-93	SLAMS	Neigh.	H,P
30-043-0903 Company Site	Microwave Montana City/Jefferson	SO_2	74-93	SPM	Neigh.	S
30-043-0908 Company Site	Ash Grove Siding Montana City/Jefferson	SO_2	89-93	SPM	Neigh.	S
30-043-0909 Company Site	Top of Microwave Montana City/Jefferson	SO_2	93	SPM	Neigh.	H,S
30-043-0910 Company Site	McClellan Creek Road #3 Montana City/Jefferson	SO_2	93	SPM	Neigh.	H,S
30-043-0911 Company Site	McClellan Creek Road #4 Montana City/Jefferson	SO_2	93	SPM	Neigh.	H,S
30-043-0912 Company Site	McClellan Creek Road #5 Montana City/Jefferson	SO_2	93	SPM	Neigh.	H,S
30-043-0913 Company Site	McClellan Creek Road #6 Montana City/Jefferson	SO_2	93	SPM	Neigh.	H,S
30-043-0914 Company Site	McClellan Creek Road #7 Montana City/Jefferson	SO_2	93	SPM	Neigh.	H,S
30-043-0915 Company Site	McClellan Creek Road #8 Montana City/Jefferson	SO_2	93	SPM	Neigh.	H,S
30-043-0916 Company Site	McClellan Creek Road #9 Montana City/Jefferson	SO_2	93	SPM	Neigh.	H,S
30-043-XXXX Proposed Site	Clancy Area Clancy/Jefferson	PM-10	94	SLAMS	Neigh.	H,P
30-049-0001	Cogswell Building Helena/Lewis & Clark	PM-10	85-93	SLAMS	Neigh.	P
30-049-0018	Lincoln School Helena/Lewis & Clark	PM-10	91-93	SLAMS	Neigh.	H,P

30-049-0701 Company Site	Kleffner Road East Helena/Lewis & Clark	SO_2	74-93	SPM	Neigh.	H,S
30-049-0702 Company Site	Water Tank East Helena/Lewis & Clark	SO_2	74-93	SPM	Neigh.	H,S
30-049-0703 Company Site	Kennedy Park East Helena/Lewis & Clark	SO_2	74-93	SPM	Neigh.	H,S
30-049-0714	Firehall East Helena/Lewis & Clark	TSP	81-93	SLAMS	Neigh.	H,P,S
		Pb	81-93	SLAMS	Micro.	H,P,S
30-049-0719	Hadfield East Helena/Lewis & Clark	TSP	81-93	SLAMS	Neigh.	H,P,S
		Pb	81-93	SLAMS	Micro.	H,P,S
30-049-0724	Dartman Field East Helena/Lewis & Clark	TSP	83-93	SLAMS	Neigh.	H,S
		Pb	83-93	SLAMS	Neigh.	H,S
30-049-0726	Old Railroad East Helena/Lewis & Clark	TSP	89-93	SLAMS	Neigh.	H,S
		Pb	89-93	SLAMS	Neigh.	H,S
30-049-XXXX Modeled Max Pb spot.	Prickly Pear Creek East Helena/Lewis & Clark	TSP	93	SLAMS	Neigh.	H,P,S
		Pb	93	SLAMS	Neigh.	H,P,S
30-053-0012	Lincoln Co. Courthouse Libby/Lincoln	PM-10	85-93	SLAMS	Neigh.	H,P

30-053-0019	Troy School Troy/Lincoln	PM-10	91-93	SLAMS	Neigh.	H,P
30-063-0005	Malfunction Junction Missoula/Missoula	CO	79-93	SLAMS	Micro.	H,P,S
30-063-0016 Company Site	Stone #2 Missoula/Missoula	PM-10	92-93	SPM	Neigh.	S
30-063-0024	Boyd Park Missoula/Missoula	PM-10	84-93	SLAMS	Neigh.	H,P
30-063-0031	Health Dept. Roof Missoula/Missoula	PM-10	86-93	SLAMS	Neigh.	H,P
30-063-0034 Company Site	Stone #1A Missoula/Missoula	PM-10	92-93	SPM	Neigh.	S
30-087-0700 Company Site	MPC #3 Colstrip/Rosebud	SO_2	82-93	SPM	Neigh.	H,P,S
		NO_2	82-93	SPM	Neigh.	H,P,S
		PM-10	89-93	SPM	Neigh.	H,P,S
30-087-0701 Company Site	MPC #1 Colstrip/Rosebud	PM-10	92-93	SPM	Neigh.	H,S
		SO_2	81-93	SPM	Neigh.	H,S
		NO_2	81-93	SPM	Neigh.	H,S
30-087-0702 Company Site	MPC #2 Colstrip/Rosebud	PM-10	92-93	SPM	Neigh.	H,S
		SO_2	81-93	SPM	Neigh.	H,S
		NO_2	81-93	SPM	Neigh.	H,S
30-087-XXXX Proposed Site	Ashland Area Ashland/Rosebud	PM-10	94	SLAMS	Neigh.	H,P

30-089-0003	Sanders Co. Courthouse Thompson Falls/Sanders	PM-10	85-93	SLAMS	Neigh.	H,P
30-093-0005	Greeley School Butte/Silver Bow	PM-10	85-93	SLAMS	Neigh.	H,P,S
30-093-XXXX Proposed Site	Harrison & Int. 90 Butte/Silver Bow	CO	94	SLAMS	Micro.	H,P
30-111-0016 Company Site	BLAQTC - Laurel Laurel/Yellowstone	SO_2	87-93	SPM	Neigh.	H,S
30-111-0066	Coburn Road Billings/Yellowstone	SO_2	81-93	SLAMS	Neigh.	H,S
30-111-0078	Diamond Parking Billings/Yellowstone	CO	92-93	SLAMS	Micro.	H,P
		PM-10	92-93	SLAMS	Neigh.	H,P
30-111-0079	Mount Olive Billings/Yellowstone	CO	92-93	SLAMS	Micro.	H,P
30-111-0080	Sacrifice Cliff Billings/Yellowstone	SO_2	93	SLAMS	Neigh.	H,S
30-111-1065 Company Site	BLAQTC - Lockwood Park Billings/Yellowstone	SO_2	87-93	SPM	Neigh.	H,P,S
30-111-2005 Company Site	BLAQTC - Brickyard Lane Billings/Yellowstone	SO_2	89-93	SPM	Neigh.	H,P,S
30-111-XXXX Proposed Site	BGI-South Johnson Lane Billings/Yellowstone	SO_2	93	SPM	Neigh.	H,P,S
30-111-XXXX Proposed Site	BGI-Pine Hills School Billings/Yellowstone	SO_2	93	SPM	Neigh.	H,P,S

TABLE 3

MONTANA EQUIPMENT PURCHASES FOR FY92

Replacement Items

Quantity	Item Description	Each	Total
1	Digital Equipment PC and Monitor	$1,400	$1,400
4	Ekto Air Monitoring Shelters	$7,870	$31,480
1	Air Conditioner for Coburn Rd. Shelter	$ 300	$ 300
2	GMW Volumetric Flow Control Retrofits	$ 815	$ 1,630
	Total of Replacement Items		$34,810

New Equipment Items

1	CD-ROM Minichanger, Interface & Software	$1,400	$ 1,400
12	Lane Portable Samplers	$1,249	$14,988
1	Laser Jet Printer	$2,510	$ 2,510
3	GMW Volumetric Flow Control Retrofits	$ 706	$ 2,118
3	GMW G1200 PM-10 Inlet	$2,295	$ 6,885
2	R M Young Wind Speed Audit Device	$ 600	$ 1,200
	Total of New Equipment Purchases		$29,101
	Total of Replacement and New Equipment		**$63,911**

TABLE 4

MONTANA EQUIPMENT PURCHASES FOR FY93

Replacement Items

Quantity	Item Description	Each	Total
4	R & P TEOM PM-10 Sampler	$16,354	$65,416
6	Soltec 1241 Strip Chart Recorder	$ 1,295	$ 7,770
	Total of Replacement Items		$73,186

New Equipment Purchases

1	Transporter for Ekto Air Shelters	$3,040	$ 3,040
	Total of New Equipment Purchases		$ 3,040
	Total of Replacement and New Equipment		**$76,226**

TABLE 5

MONITORING EQUIPMENT REPLACEMENT AND NEW PURCHASE PLAN

AIRS Number / Site Name/Address City/County								Proposed Replacement Costs			
Ownership	Equipment Type	Model	# of Manufacturer	Units	Acq.Date	Condition	Rep.Cost	FY-94	FY-95	FY-96	•••••••••••••• COMMENTS ••••••••••••••
30-001-XXXX	Industrial Area Dillon/Beaverhead										
New Equipment	PM-10	1200	Sierra Anderson	2	-----	New	$8,000	-----	-----	$8,000	
30-013-0009	Fire Station #1 Great Falls/Cascade										
EPA	PM-10	321B	Sierra Anderson	2	≈ 10/84	Good	$8,000	-----	-----	-----	No current need to replace. Mass flow controllers were replaced with volumetric flow controllers between 8/89 and 10/90.
30-013-1025	Skyway Conoco Great Falls/Cascade										
MT	CO	8830	Monitor Labs	1	1/92	Good	$7,000	-----	-----	-----	
MT	Data Acquisition System	ICIS-3	Western Telecomputing Corporation	1	6/90	Good	$3,500	-----	-----	-----	
MT	Met System	WM-III	Climatronics	1	≈ 4/79	Fair	$3,000	-----	-----	$3,000	
MT	Dilution System	3000	EESI	1	3/92	Good	$6,100	-----	-----	-----	
MT	Shelter	-----	EKTO	1	9/92	Good	$7,000	-----	-----	-----	
MT	Recorder	1241	Soltec	1	9/92	Good	$1,400	-----	-----	-----	
30-029-0003	Col. Falls Jr. High Columbia Falls/ Flathead										
MT	PM-10	-----	Wedding & Associates	3	2/87 3/88 7/89	Good	$12,000	-----	-----	-----	

30-029-0039	Markus Foods Whitefish/Flathead										
EPA	PM-10	321B	Sierra Anderson	3	⇐ 10/84	Good	$12,000	-----	-----	-----	No current need to replace. Mass flow controllers were replaced with volumetric flow controllers between 8/89 and 10/90.
30-029-0041	Patterson Corral Whitefish/Flathead										
State	PM-10	1200	Sierra Anderson	1	3/91	Good	$4,000	-----	-----	-----	
30-029-1015	Universal Athletics Kalispell/Flathead										
EPA	PM-10	321B	Sierra Anderson	3	⇐ 10/84	Good	$12,000	-----	-----	-----	No current need to replace. Mass flow controllers were replaced with volumetric flow controllers between 8/89 and 10/90.
30-029-1017	Courthouse East Kalispell/Flathead										
MT	PM-10	TEOM 1400	Rupprecht & Patashnick	1	6/93	New	$18,000	-----	-----	-----	
MT	Recorder	1241	Soltec	1	9/92	Good	$1,400	-----	-----	-----	
MT	Data Acquisition System	ICIS-3	Western Telecomputing Corporation	1	10/92	Good	$3,500	-----	-----	-----	
MT	Flow Calibrator	Dry CAL	Bios	1	-----	New	$1,450	-----	$1,400	-----	
30-029-XXXX	Idaho and Main St. Kalispell/Flathead										
New Equipment	CO	-----	Monitor Labs or equivalent	1	-----	New	$7,000	-----	$7,000	-----	Existing spare Dasibi 3003 analyzer could be used temporarily for this site.
New Equipment	Data Acquisition System	ICIS-3	Western Telecomputing Corporation	1	-----	New	$3,500	$3,500	-----	-----	
New Equipment	Met System	-----	Climatronics	1	-----	New	$3,000	-----	$3,000	-----	
New Equipment	Dilution System	3000	Enviro Electronic Service Inc. (EESI)	1	-----	New	$6,100	$6,100	-----	-----	

New Equipment	Shelter	-----	EKTO	1	-----	New	$7,000	$7,000	-----	-----	
New Equipment	Recorder	1241	Soltec	1	-----	New	$1,400	$1,400	-----	-----	
30-031-0002	East Main City Bldg. Bozeman/Gallatin										
EPA	PM-10	321B	Sierra Anderson	2	≈ 10/84	Good	$8,000	-----	-----	-----	No current need to replace. Mass flow controllers were replaced with volumetric flow controllers between 8/89 and 10/90.
30-031-0008	Belgrade ConAgra Belgrade/Gallatin										
MT	PM-10	1200	Sierra Anderson	2	10/90	Good	$8,000	-----	-----	-----	No current need to replace.
30-043-XXXX	Clancy Area Clancy/Jefferson										
New Equipment	PM-10	1200	Sierra Anderson	2	-----	New	$8,000	-----	-----	$8,000	
30-049-0001	Cogswell Building Helena/Lewis & Clark										
EPA	PM-10	321B	Sierra Anderson	1	≈ 10/84	Good	$4,000	-----	-----	-----	No current need to replace. Mass flow controllers were replaced with volumetric flow controllers between 8/89 and 10/90.
30-049-0018	Lincoln School Helena/Lewis & Clark										
County	PM-10	321B	Sierra Anderson	2	≈ 6/88	Good	$4,000	-----	-----	-----	No current need to replace. Mass flow controllers were replaced with volumetric flow controllers between 8/89 and 10/90.
MT	Flow Calibrator	Dry-Cal	Bios	1	-----	New	$1,450	$1,450	-----	-----	
MT	PM-10	TEOM 1400	Rupperecht & Patashnick	1	6/93	New	$18,000	-----	-----	-----	
MT	Recorder	1241	Soltec	1	9/92	Good	$1,400	-----	-----	-----	
MT	Shelter	-----	Trailer (13 foot)	1	10/72	Poor	$8,000	-----	-----	$8,000	
County	Data Acquisition System	CR10WP	Campbell	1	≈ 6/88	Good	$1,800	-----	-----	-----	

30-049-0714	Firehall East Helena/Lewis & Clark										
MT	TSP	-----	General Metal Works	2	≈ 6/75	Good	$4,000	-----	-----	-----	
30-049-0719	Hadfield East Helena/Lewis & Clark										
MT	TSP	-----	General Metal Works	2	≈ 6/75	Good	$4,000	-----	-----	-----	
30-049-0724	Dartman Field East Helena/Lewis & Clark										
MT	TSP	-----	General Metal Works	2	≈ 6/75	Good	$4,000	-----	-----	-----	
30-049-0726	Old Railroad East Helena/Lewis & Clark										
MT	TSP	-----	General Metal Works	2	≈ 6/75	Good	$4,000	-----	-----	-----	
30-053-0012	Lincoln Co. Courthouse Libby/Lincoln										
EPA	PM-10	321B	Sierra Anderson	4	≈ 10/84	Good	$16,000	-----	-----	-----	No current need to replace. Mass flow controllers were replaced with volumetric flow controllers between 8/89 and 10/90.
30-053-0018	County Courthouse Annex Libby/Lincoln										
MT	PM-10	TEOM 1400	Rupprecht Patashnick	1	6/93	New	$18,000	-----	-----	-----	
MT	Data Acquisition System	ICIS-3	Western Telecomputing Corporation	1	6/90	Good	$3,500	-----	-----	-----	
MT	Recorder	1241	Soltec	1	9/92	Good	$1,400	-----	-----	-----	

MT	Flow Calibrator	DRY-CAL	Bios	1	----	New	$1,450	-----	$1,450	-----	
30-053-0019	Troy School Troy/Lincoln										
MT	PM-10	1200	Sierra Anderson	2	3/91	Good	$8,000	-----	-----	-----	
30-063-0005	Malfunction Junction Missoula/Missoula										
MT	CO	3003	Desibi	1	5/90	Good	$6,500	-----	-----	-----	No current need to replace.
MT	Data Acquisition System	ICIS-3	Western Telecomputing Corporation	1	6/90	Good	$3,500	-----	-----	-----	
MT	Dilution System	3000	Enviro Electronic Service Inc. (EESI)	1	3/92	Good	$6,000	-----	-----	-----	
County	Shelter	-----	RAPS/RAM shelter	1	≈ 6/75	Fair	$8,000	-----	-----	-----	No current need to replace. Missoula county has insulated this shelter and it is at a long-term location.
MT	Recorder	1241	Soltec	1	9/92	Good	$1,400	-----	-----	-----	
30-063-0024	Boyd Park Missoula/Missoula										
County	PM-10	321B	Sierra Anderson	3	≈ 10/84	Good	$12,000	-----	-----	-----	No current need to replace. Mass flow controllers were replaced with volumetric flow controllers between 8/89 and 10/90.
MT	Flow Calibrator	DRY CAL	Bios	1	-----	New	$1,450	-----	$1,450	-----	
County	Data Acquisition System	ICIS-3	Western Telecomputing Corporation	1	6/90	Good	$3,500	-----	-----	-----	
MT	PM-10	TEOM 1400	Rupprecht & Patashnick	1	-----	New	$18,000	$18,000	-----	-----	
County	Shelter	-----	RAPS/RAM shelter	1	≈ 6/75	Fair	$8,000	-----	-----	-----	No current need to replace. Missoula county has insulated this shelter and it is at a long-term location.
MT	Recorder	1241	Soltec	1	-----	New	$1,400	-----	$1,400	-----	

30-063-0031	Health Dept. Roof Missoula/Missoula										
EPA	PM-10	321B	Sierra Anderson	2	≈ 10/84	Good	$8,000	-----	-----	-----	No current need to replace. Mass flow controllers were replaced with volumetric flow controllers between 8/89 and 10/90.
30-087-XXXX	Ashland Area Ashland/Rosebud										
New Equipment	PM-10	1200	Sierra Anderson	2	-----	New	$8,000	-----	-----	$8,000	
30-089-0003	Sanders Co. Courthouse Thompson Falls/Sanders										
EPA	PM-10	321B	Sierra Anderson	3	≈ 10/84	Good	$12,000	-----	-----	-----	No current need to replace. Mass flow controllers were replaced with volumetric flow controllers between 8/89 and 10/90.
30-093-0005	Greeley School Butte/Silver Bow										
EPA	PM-10	321B	Sierra Anderson	4	≈ 10/84	Good	$16,000	-----	-----	-----	No current need to replace. Mass flow controllers were replaced with volumetric flow controllers between 8/89 and 10/90.
MT	PM-10	TEOM 1400	Rupprecht & Pateshnick	1	6/93	New	$18,000	-----	-----	-----	
MT	Data Acquisition System	ICIS-3	Western Telcomputing Corporation	1	6/90	Good	$3,500	-----	-----	-----	
MT	Flow Calibrator	Dry-CAL	Bios	1	-----	New	$1,450	------	$1,450	-----	
MT	Recorder	1241	Soltec	1	9/92	Good	$1,400	-----	-----	-----	
EPA	Shelter	-----	RAPS/RAM shelter	1	9/92	Good	$8,000	-----	------	-----	No current need to replace. The department reinsulated the shelter on 9/91 and the shelter roof is used as a platform for PM-10's.

30-093-XXXX	Harrison & Int. 90 Butte/Silver Bow										
New Equipment	CO	-----	Monitor Labs or equivalent	1	-----	New	$7,000	-----	$7,000	-----	Existing spare Dasibi 3003 analyzer could temporarily used for this site.
New Equipment	Data Acquisition System	ICIS-3	Western Telecomputing Corporation	1	-----	New	$3,500	$3,500	-----	-----	
New Equipment	Met System	-----	Climatronics	1	-----	New	$3,000	-----	$3,000	-----	
New Equipment	Dilution System	3000	Enviro Electronic Service Inc. (EESI)	1	-----	New	$6,100	$6,100	-----	-----	
New Equipment	Shelter	-----	EKTO	1	-----	New	$7,000	$7,000	-----	-----	
New Equipment	Recorder	1241	Soltec	1	-----	New	$1,400	$1,400	-----	-----	
30-111-0066	Coburn Road Billings/Yellowstone										
MT	SO_2	100	Advanced Pollution Instrumentation, Inc.	1	3/91	Good	$10,000	-----	-----	-----	No current need to replace.
BLAQTC	Data Acquisition System	ICIS-3	Western Telecomputing Corporation	1	8/89	Good	$3,500	-----	-----	-----	
MT	Met System	Main-frame	Climatronics	1	4/79	Fair	$4,000	$4,000*	-----	-----	*Upgrade to collect 'delta' T and solar radiation.
MT	Dilution System	3000	Enviro Electronic Service Inc. (EESI)	1	3/91	Good	$6,100	-----	-----	-----	
EPA	Shelter	-----	RAPS/RAM Shelter	1	~6/76	Fair	$8,000	-----	-----	-----	Previously at Ponderosa School, moved to Coburn Road 10/92, extensively insulated, rewired, etc. No current need to replace.
MT	Recorder	1241	Soltec	1	9/92	Good	$1,400	-----	-----	-----	
30-111-0078	Diamond Parking Billings/Yellowstone										
MT (1) County (1)	PM-10	----	Wedding	2	7/88 8/89	Good	$8,000	-----	-----	-----	One PM-10 is owned by the state and the other is owned by Yellowstone County.

MT	CO	3003	Dasibi	1	4/81	Good	$7,000	-----	-----	-----	This analyzer was upgraded and rebuilt in 1990.
MT	Data Acquisition System	ICIS-3	Western Telecomputing Corportation	1	6/90	Good	$3,500	-----	-----	-----	
MT	Dilution System	3000	Enviro Electronic Service Inc. (EESI)	1	1/92	Good	$6,100	-----	-----	-----	
MT	Shelter	-----	EKTO	1	9/92	Good	$7,000	-----	-----	-----	
MT	Recorder	1241	Soltec	1	9/92	Good	$1,400	-----	-----	-----	
30-111-0079	Mount Olive Billings/Yellowstone										
MT	CO	3003	Dasibi, Inc.	1	4/81	Good	$7,000	-----	-----	-----	This analyzer was upgraded and rebuilt in 1990.
MT	Data Acquisition System	ICIS-3	Western Telecomputing Corporation	1	6/90	Good	$3,500	-----	-----	-----	
MT	Met System	WM-III	Climatronics	1	4/78	Fair	$3,000	-----	-----	$3,000	
MT	Dilution System	3000	Enviro Electronic Service Inc. (EESI)	1	3/91	Good	$6,000	-----	-----	-----	
MT	Shelter	-----	EKTO	1	9/92	Good	$7,000	-----	-----	-----	
MT	Recorder	1241	Soltec	1	9/92	Good	$1,400	-----	-----	-----	
30-111-0080	Sacrifice Cliff Billings/Yellowstone										
MT	SO_2	100	Advanced Pollution Instrumentation, Inc.	1	3/91	Good	$10,000	-----	-----	-----	No current need to replace.
MT	Data Acquisition System	ICIS-3	Western Telecomputing Corporation	1	6/92	Good	$3,500	-----	-----	-----	
MT	Met System	WM-III	Climatronics	1	~10/76	Fair	$4,000	$4,000	-----	-----	
MT	Dilution System	3000	Enviro	1	3/91	Good	$6,100	-----	-----	-----	

			Electronic								
MT	Shelter	-----	EKTO	1	9/92	Good	$7,000	-----	-----	-----	
MT	Recorder	1241	Soltec	1	9/92	Good	$1,400	-----	-----	-----	
30-111-XXXX	SO_2 Sites Billings/Yellowstone										
New Equipment	SO_2	100	Advanced Pollution Instrumentation, Inc.	2	----	New	$10,000	$20,000	-----	-----	Backup analyzers for Billings SO_2 SIP work.
30-XXX-XXXX	Statewide										
Modifications	PM-10/CO	-----	Lane	24	----	New	$320	$7,700	-----	-----	Upgrades to existing portable saturation samples.
30-XXX-XXXX	Statewide										
New Equipment	PM-10/ PM-2.5	Partisol 2000	Rupprecht & Pateshnick	4	----	New	$3,125	-----	-----	$12,500	Replacement samplers for use in specialized particulate studies (e.g. CMB). They will replace existing dichot samplers that are 20 years old.
New Equipment	Flow Calibrator	Dry-CAL	Bios	1	----	New	$1,450	-----	-----	$1,450	Flow measurement device for TEOM PM-10 monitors.
New Equipment	Shelter	-----	EKTO	1	----	New	$7,500	-----	-----	$7,500	Replacement shelter for use in specialized particulate studies (e.g. CMB).
TOTALS								$91,150	$27,150	$59,450	

TABLE 6

MONTANA NETWORK MODIFICATIONS GOALS FOR FY93

PRI	AIRS Number	Site Name/Address City/County	Parm	********** Comments **********
1.	30-029-0003	C.Falls Jr High C.Falls/Flathead	PM-10	Change sampling frequency from every day to 1-in-6 and 1-in-2 during the 2nd/3rd and 1st/4th quarters respectively.
	Status:	Frequency change went into effect on 7-1-92.		
2.	30-029-1015	Universal Athletics Kalispell/Flathead	PM-10	Change sampling frequency from every day year-round to a 1-in-1 and 1-in-2 schedule during the 1st/4th and 2nd/3rd quarters respectively.
	Status:	Frequency change went into effect on 7-1-92.		
3.	30-089-0003	Sanders Cnty Courthouse T.Falls/Sanders	PM-10	Change sampling frequency from every day year-round to a 1-in-2 and 1-in-6 schedule during the 1st/4th and 2nd/3rd quarters respectively.
	Status:	Frequency change went into effect on 7-1-92.		
4.	30-093-0005	Greeley School Butte/Silver Bow	PM-10	Change sampling frequency from every day year-round to a 1-in-2 and 1-in-6 schedule during the 1st/4th and 2nd/3rd quarters respectively.
	Status:	Frequency change went into effect on 7-1-92.		

5.	30-029-0041	Patterson Corral Whitefish/Flathead	PM-10	Establish special purpose monitoring background site for Whitefish CMB.

Status: Site was installed and began operation on 1-1-93.

6.	30-111-0075	Metra-4th and Expo Billings/Yellowstone	CO	Shut down site as a result of CO saturation study.

Status: Site was discontinued on 7-1-92.

7.	30-111-0079	Mount Olive Billings/Yellowstone	CO	Establish a CO site at maximum concentration location(s) as a result of the saturation study.

Status: Site began operation in November, 1992.

8.	30-111-0077	Federal Credit Union Billings/Yellowstone	PM-10	Shut down site due to security reasons and move the site one city block directly west to the Diamond Parking site.

Status: The site was shut down on 8-4-92.

9.	30-111-0078	Diamond Parking Billings/Yellowstone	PM-10	Establish PM-10 site to replace the shut-down Federal Credit Union site.
			CO	Establish CO site as a result of CO saturation study (maximum concentration site).

Status: Site began operation in November 1992.

10.	30-023-0010	Teressa Ann Terrace Anaconda/Deer Lodge	PM-10	Shut down site because of consistently low readings.

Status: The site was discontinued effective 4-1-93.

11.	30-049-0719	Hadfield PM-10 E.Helena/Lewis and Clark	PM-10	Discontinue PM-10 site in East Helena because readings from inception have been low.

Status: The site was discontinued effective 4-1-93.

12.	30-053-0012	Courthouse Annex Libby/Lincoln	PM-10	Change sampling frequency from every day year-round to a 1-in-2 and 1-in-6 schedule during the 1st/4th and 2nd/3rd quarters respectively.

Status: Changed frequency on 7-1-92.

13.	30-049-0018	Lincoln School Helena/Lewis & Clark	B-scat	Discontinue nephelometer on 2-28-93 to replace with TEOM.

Status: Nephelometer data collection discontinued on 2-28-93.

14.	30-093-0005	Greeley School Butte/Silver Bow	B-scat	Discontinue nephelometer on 3-31-93 to replace with TEOM.

Status: Nephelometer data collection discontinued on 3-31-93.

15.	30-029-1017	Courthouse East Kalispell/Flathead	B-scat	Discontinue nephelometer on 3-31-93 to replace with TEOM (in a nearby but different building).

Status: Nephelometer data collection discontinued on 3-31-93.

16.	30-013-0009	Firestation #1 Great Falls/Cascade	PM-10	Discontinue collocated sampler and change from a 1-in-6 collocated to a 1-in-3 single sample schedule beginning 11-1-92. Take over filter processing responsibility from CCHD.

Status: The sampling frequency was changed from collocated 1-in-6 to single 1-in-3 schedule beginning 11-1-92. Filter processing was taken over by the department on the same date.

17.	30-093-0008	Greenhouse Butte/Silver Bow	PM-10	Discontinue site due to low readings and since the Greeley site has proven to have consistently higher PM-10 readings.

Status: Site was discontinued on 7-1-92.

18.	30-111-0076	Ponderosa School Billings/Yellowstone	SO_2	Discontinue site due to low readings and relocate monintoring shelter to Coburn Road for security reasons.

Status: Monitoring stopped on 7-1-92 and shelter moved to Coburn Road on 10-1-92.

19.	30-111-0080	Sacrifice Cliff Billings/Yellowstone	SO_2	Establish a site at the maximum SO_2 concentration location in Billings as predicted by the results of an EPA approved dispersion modeling study.

Status: Site began operation on 5-19-93.

20.	30-053-1005	Lincoln Electric Coop Eureka/Lincoln	PM-10	Discontinue site due to low readings and to allow use of samplers at other locations.

Status: Site discontinued on 7-1-92.

21.	30-063-0005	Malfunction Junction Missoula/Missoula	CO	Operate CO site year-round after maximum CO concentration location was found and oxygenated fuels program was established in October, 1992.

Status: Started collecting CO data on a yearly basis on 10-1-92.

22.	30-093-XXXX	Harrison & Int. 90 Butte/Silver Bow	CO	Establish a CO site near the intersection of Harrison and Interstate 90 in Butte.

Status: The establishment of this CO site is on hold pending a future CO saturation study.

23.	30-029-XXXX	Idaho and Main St. Kalispell/Flathead	CO	Establish a CO site in Kalispell in 1992.

Status: The establishment of this CO site is on hold pending a future CO saturation study.

24.	30-043-XXXX	Clancy Area Clancy/Jefferson	PM-10	Establish a PM-10 site in an area of rapid residential growth just southeast of Helena.

Status: Pending available resources.

25.	30-001-XXXX	Dillon Industrial Area Dillon/Beaverhead	PM-10	Establish a new site near the industrial area south of Dillon.

Status: Pending available resources.

26.	30-087-XXXX	Ashland Area Ashland/Rosebud	PM-10	Establish a PM-10 site for the town of Ashland.

Status: Pending available resources.

27.	30-043-0909	Top of Microwave Montana City/Jefferson	SO_2	Establish SO_2 site as a result of dispersion modeling for SO_2 SIP revision.

Status: Site was installed in January, 1993.

28.	30-043-0910	McClellan Creek Road #3 Montana City/Jefferson	SO_2	Establish SO_2 site as a result of dispersion modeling for SO_2 SIP revision.

Status: Site was installed in January, 1993.

29.	30-043-0911	McClellan Creek Road #4 Montana City/Jefferson	SO_2	Establish SO_2 site as a result of dispersion modeling for SO_2 SIP revision.

Status: Site was installed in January, 1993.

30.	30-043-0912	McClellan Creek Road #5 Montana City/Jefferson	SO_2	Establish SO_2 site as a result of dispersion modeling for SO_2 SIP revision.

Status: Site was installed in January, 1993.

31.	30-043-0913	McClellan Creek Road #6 Montana City/Jefferson	SO_2	Establish SO_2 site as a result of dispersion modeling for SO_2 SIP revision.

Status: Site was installed in January, 1993.

32.	30-043-0914	McClellan Creek Road #7 Montana City/Jefferson	SO_2	Establish SO_2 site as a result of dispersion modeling for SO_2 SIP revision.

Status: Site was installed in January, 1993.

33.	30-043-0915	McClellan Creek Road #8 Montana City/Jefferson	SO_2	Establish SO_2 site as a result of dispersion modeling for SO_2 SIP revision.

Status: Site was installed in January, 1993.

34.	30-043-0916	McClellan Creek Road #9 Montana City/Jefferson	SO_2	Establish SO_2 site as a result of dispersion modeling for SO_2 SIP revision.

Status: Site was installed in January, 1993.

35.	30-087-0701	MPC #1 Colstrip/Rosebud	PM-10	Change over existing TSP samplers to PM-10.

Status: PM-10 sampling began on 7-2-92.

36.	30-087-0702	MPC #2 Colstrip/Rosebud	PM-10	Change over existing TSP samplers to PM-10.

Status: PM-10 sampling began on 7-2-92.

37.	30-087-0704	MPC #4 Colstrip/Rosebud	PM-10	Discontinue the site due to low readings and the fact that the other three MPC sites at Colstrip provide adequate spatial coverage.

Status: Site was discontinued on 7-1-92.

TABLE 7

MONTANA NETWORK MODIFICATIONS GOALS FOR FY94

PRI	AIRS Number	Site Name/Address City/County	Parm	********** Comments **********
1.	30-063-0024	Boyd Park Missoula/Missoula	PM-10	Transfer PM-10 filter weighings and processing from county lab to state lab starting 7-1-93.
2.	30-063-0031	Health Dept Roof Missoula/Missoula	PM-10	Transfer PM-10 filter weighings and processing from county lab to state lab starting 7-1-93.
3.	30-049-0018	Lincoln School Helena/Lewis & Clark	PM-10	Install continuous PM-10 sampler (TEOM) and begin AIRS data reporting on 10-1-93.
4.	30-029-XXXX	Courthouse East Kalispell/Flathead	PM-10	Install a continuous PM-10 sampler (TEOM) in a nearby but different building at the Courthouse East site. Begin AIRS data reporting on 10-1-93.
5.	30-053-0018	Courthouse Annex Libby/Lincoln	B-scat	Discontinue nephelometer on 9-30-93.
6.	30-053-0018	Courthouse Annex Libby/Lincoln	PM-10	Install a continuous PM-10 sampler (TEOM) at the courthouse annex site and begin AIRS data reporting on 10-1-93.
7.	30-093-0005	Butte/Silver Bow Cnty Butte/Silver Bow	PM-10	Install a continuous PM-10 sampler (TEOM) at the Greeley School site and begin AIRS data reporting on 10-1-93.

8.	30-029-XXXX	Courthouse East Kalispell/Flathead	PM-10	Install single high volume PM-10 sampler next to the TEOM inlet to be used for comparison.
9.	30-043-XXXX	Clancy Area Clancy/Jefferson	PM-10	Establish a PM-10 site at the north end of Jefferson County.
10.	30-049-0719	Hadfield East Helena/Lewis & Clark	TSP/Pb	Discontinue site and move equipment to new site on Prickly Pear Creek.
11.	30-049-XXXX	Prickly Pear Creek East Helena/Lewis & Clark	TSP/Pb	Establish maximum concentration TSP/Pb site at Pacific Street and Prickly Pear Creek. This would become the collocated site.
12.	30-111-XXXX	BGI-South Johnson Lane Billings/Yellowstone	SO_2	Establish a monitoring site located by the dispersion modeling done for the BGI permit.
13.	30-111-XXXX	BGI-Pine Hills School Billings/Yellowstone	SO_2	Establish a monitoring site located by the dispersion modeling done for the BGI permit.
14.	30-111-XXXX	BGI-Billings Heights Billings/Yellowstone	SO_2	Relocate the Brickyard Lane SO_2 site to the Billings Heights area in response to public inquiries about SO_2 concentrations in the Heights.
15.	30-029-0041	Patterson Corral Whitefish/Flathead	PM-10	Discontinue site with conclusion of the 1993 calender year CMB study.

16.	30-081-XXXX	Hamilton Hamilton/Ravalli	PM-10	Establish site in town in response to citizen concern about high particulate levels.
17.	30-087-XXXX	Ashland Area Ashland/Rosebud	PM-10	Establish a PM-10 site in Ashland.
18.	30-093-XXXX	Harrison & Int. 90 Butte/Silver Bow	CO	Establish a CO site near the intersection of Harrison and Interstate 90 in Butte in 1994.
19.	30-029-XXXX	Idaho and Main St. Kalispell/Flathead	CO	Establish a CO site in Kalispell in 1994.

APPENDIX B: EMISSION INVENTORY DATA FOR 1992

EMISSION INVENTORY DATA FOR 1992

This appendix presents emission inventory data for 1992 from the major point sources throughout Montana. The information is sorted by county. The department uses point, area and mobile source emission inventory data to assess the adequacy of the air monitoring network and determine if additional sites are needed.

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 001 BEAVERHEAD CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	STOLTZE, F H		2421	142	12	363.7	4999.4	8	90	12.8	32.5	0.0	0.5	2.7
0001	BOX 389													
	DILLON	59725												
00002	BARRETTS MINERALS INC.		3295	142	12	363.2	4998.8	40	92	62.3	6.9	0.4	24.8	0.8
0002	8625 MT HWY 91 SOUTH													
	DILLON	59725												
00004	CENTENNIAL FOODS, INC.		2043	142	12	385.3	5019.0	10	92	0.1	0.0	0.0	0.2	0.0
0004	1575 EAST BENCH ROAD, HWY. 41													
	DILLON	59725												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									75.2	39.4	0.4	25.5	3.5

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 003 BIG HORN CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00002	WESTMORELAND RESOURCES		1211	140	13	338.0	5074.6	17	92	239.6	109.1	11.3	134.6	16.3
0002	EAST OF HARDIN													
	HARDIN	59034												
00003	NERCO-SPRNG CRK COAL		1211	140	13	351.5	4997.0	16	92	255.5	204.4	18.3	217.6	27.2
0003	SPRING CREEK MINE													
	DECKER	59025												
00004	DECKER COAL COMPANY - WEST		1211	140	13	357.0	4989.0	17	92	619.3	238.1	29.6	359.1	39.7
0004	WEST DECKER MINE													
	DECKER	59025												
00001	DECKER COAL COMPANY - EAST		1211	140	13	359.5	4991.0	17	92	313.8	210.9	22.4	266.1	32.0
0001	EAST DECKER MINE													
	DECKER	590250000												
	NUMBER OF PLANTS > 100 TONS PER YEAR									4	4	0	4	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									1428.2	762.5	81.6	977.4	115.2

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 007 BROADWATER CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00002	CONTINENTAL LIME		3274	142	12	453.0	5131.0	20	92	159.9	269.7	381.6	373.5	8.4
0002	INDIAN CREEK													
	TOWNSEND	596440000												
		NUMBER OF PLANTS > 100 TONS PER YEAR								1	1	1	1	0
		TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)								159.9	269.7	381.6	373.5	8.4

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 009 CARBON CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	MONTANA LIMESTONE CO		1499	140	12	684.5	4991.7	4	91	15.6	0.0	0.0	0.0	0.0
0001	P.O. BOX 463													
	BRIDGER	59014												
		NUMBER OF PLANTS > 100 TONS PER YEAR								0	0	0	0	0
		TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)								15.6	0.0	0.0	0.0	0.0

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 013 CASCADE CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00004	MONTANA REFINING		2911	141	12	478.1	5263.0	21	92	64.1	15.9	1676.2	73.7	877.0
0004	1900 10TH STREET													
	BLACK EAGLE	59404												
00011	UNITED MATERIALS		1446	141	12	467.0	5253.5	6	92	29.2	0.0	0.9	0.6	0.0
0011	2100 9TH AVENUE NO.													
	GREAT FALLS	59401												
00013	CEREAL FOOD PROCESSORS, INC.		2041	141	12	479.0	5262.2	4	92	13.2	0.1	0.0	0.5	0.0
0013	900 16TH STREET NORTH													
	GREAT FALLS	594010000												
00014	MT DEPT TRANSPORTATION ASPHALT BAT		1611	141	12	471.5	5263.0	2	92	3.5	0.0	0.0	0.0	0.0
0014	EMERSON JUNCTION													
	GREAT FALLS	59403												
00015	GTA FEEDS		2048	141	12	483.0	5262.5	6	92	3.5	0.0	0.0	0.4	0.0
0015	NORTHEAST BYPASS													
	GREAT FALLS	59403												
00016	MALMSTROM AFB, BUILDING 82110		9711	141	12	485.7	5263.0	4	92	0.6	6.0	0.0	83.6	0.2
0016	7619 14TH AVENUE NORTHSQUADRON													
	MALMSTOM AFB	594026788												
00009	HARVEST STATES COOPERATIVE ELEVATO		4221	141	12	475.5	5260.0	2	92	0.2	0.0	0.0	0.0	0.0
0009	600 6TH STREET, SW													
	GREAT FALLS	59404												
00007	BIG SKY FEED & SUP.		2048	141	12	478.0	5262.0	3	92	0.1	0.0	0.0	0.0	0.0
0007	601 8TH AVE., N.													
	GREAT FALLS	594030000												
00001	LEWIS CONSTRUCTION COMPANY, TOWN P		1611	141	12	478.0	5262.3	2	92	6.1	0.1	6.1	0.5	0.0
0001	1025 11TH AVENUE NORTH													
	GREAT FALLS	59406												
00003	GENERAL MILLS, INC.		2041	141	12	480.3	5262.3	8	92	35.8	0.0	0.0	0.3	0.0
0003	2500 9TH AVENUE NORTH													
	GREAT FALLS	59403												
00012	AGRI BASICS		0723	141	12	479.0	5262.2	6	92	3.5	0.1	0.0	0.7	0.0
0012	900 16TH STREET NO.													
	GREAT FALLS	59401												
00018	LEWIS CONSTRUCTION COMPANY - VAUGH		2951	141	12	451.6	5265.3	3	92	14.2	0.4	3.9	0.8	0.3
0018	P.O. BOX 2669													
	GREAT FALLS	59403												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	1	0	1
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									174.0	22.6	1687.1	161.1	877.5

OATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 017 CUSTER CO

PLANT	NAME AND ADDRESS	SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	WILLISTON BASIN - HATHAWAY STATION	4922	143	13	417.4	5129.5	2	92	0.8	7.0	0.0	17.7	0.4
0001	16 MILES WEST OF MILES CITY												
	HATHAWAY 59333												
	NUMBER OF PLANTS > 100 TONS PER YEAR								0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)								0.8	7.0	0.0	17.7	0.4

OATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 021 DAWSON CO

PLANT	NAME AND ADDRESS	SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00002	CENTURY PAVING	2951	143	13	511.2	5216.7	3	92	1.6	0.0	0.1	0.2	0.0
0002	WEST OF GLENDIVE												
	GLENDIVE 59330												
	NUMBER OF PLANTS > 100 TONS PER YEAR								0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)								1.6	0.0	0.1	0.2	0.0

OATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 025 FALLON CO

PLANT	NAME AND ADDRESS	SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	WESTERN GAS RESOURCES - BAKER GAS	4922	143	13	571.7	5136.1	3	92	0.3	83.2	0.0	85.3	16.5
0001	SEC. 6, T7N, R60E												
	BAKER 59313												
00002	WILLISTON BASIN - LITTLE BEAVER	4922	143	13	572.3	5105.1	12	92	0.1	4.7	0.0	37.7	0.9
0002	HC 73 BOX 5013												
	BAKER 59313												
00003	WILLISTON BASIN - CABIN CREEK	4922	143	13	544.5	5162.2	19	92	3.8	51.6	0.2	269.0	6.6
0003	HC 72 BOX 6020												
	BAKER 59313												
00004	SWEPI - CABIN CREEK ENGINE	4922	143	13	537.4	5163.4	1	92	0.4	20.2	0.0	159.8	3.8
0004	SEC. 17, T10N, R58E												
	BAKER 59313												
	NUMBER OF PLANTS > 100 TONS PER YEAR								0	0	0	2	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)								4.6	159.7	0.2	551.8	27.8

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 027 FERGUS CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00004	CENTURY PAVING		2951	140	12	615.6	5212.3	2	92	0.2	0.0	0.0	0.0	0.0
0004	BOX 739													
	LEWISTOWN	59457												
00005	C R KENDALL		1041	140	12	616.5	5237.5	14	92	117.2	106.3	13.1	119.7	6.2
0005	PO BOX 799													
	HILGER	59451												
										---	---	---	---	---
	NUMBER OF PLANTS > 100 TONS PER YEAR									1	1	0	1	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									117.4	106.3	13.1	119.7	6.2

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 029 FLATHEAD CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00024	A-1 PAVING, INC.		1611	144	0	0.0	0.0	2	92	6.0	1.7	3.7	3.1	0.7
0024	3131 HIGHWAY 2 EAST													
	KALISPELL	59901												
00025	MC ELROY AND WILKEN		1442	144	0	0.0	0.0	2	92	18.2	0.0	0.0	0.0	0.0
0025	801 WHITEFISH STAGE													
	KALISPELL	59901												
00005	PLUM CREEK EVERGREEN		2436	144	11	701.6	5345.3	11	92	114.7	158.2	5.9	110.7	67.9
0005	2 MI NE OF KALISPELL													
	KALISPELL	59901												
00006	KLINGLER LUMBER		2421	144	11	700.5	5342.9	4	92	4.8	54.2	0.0	0.4	4.5
0006	1/4 MI NE OF KALISPELL													
	KALISPELL	59901												
00008	PLUM CREEK-COLUMBIA FALLS		2436	144	11	708.1	5361.8	32	92	472.9	420.5	15.7	273.7	155.4
0008	500 12TH AVENUE WEST													
	COLUMBIA FALLS	59912												
00010	STOLTZE LAND AND LUMBER COMPANY		2421	144	11	704.1	5362.8	10	92	95.4	42.0	1.5	7.1	14.7
0010	3 MI W OF COLUMBIA FALLS													
	COLUMBIA FALLS	59912												
00016	PACK & COMPANY		2951	144	11	698.4	5345.7	3	92	5.5	0.4	0.9	0.4	0.3
0016	2355 HWY 93N													
	KALISPELL	59901												
00017	FLATHEAD COUNTY ASPHALT PLANT		2951	144	11	705.2	5343.2	2	92	29.4	0.3	0.6	0.3	0.2
0017	5 MILES EAST OF KALISPELL													
	KALISPELL	59901												
00019	MONTANA MOKKO		2421	144	11	700.3	5343.3	4	92	10.9	0.1	0.0	0.9	0.0
0019	955 WHITEFISH STAGE ROAD													
	KALISPELL	59901												
00003	AMERICAN TIMBER COMPANY		2421	144	11	679.0	5378.5	6	92	106.6	124.0	4.6	21.0	43.4
0003	P.O. BOX 128													
	OLNEY	59927												
00012	COLUMBIA FALLS ALUMINUM		3334	144	11	712.1	5363.8	30	92	459.1	32706.5	1681.7	0.0	508.8
0012	2000 ALUMINUM DRIVE													
	COLUMBIA FALLS	59912												
	NUMBER OF PLANTS > 100 TONS PER YEAR									4	4	1	2	2
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									1323.5	33507.9	1714.6	417.6	795.9

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 031 GALLATIN CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00004	LOUISIANA-PACIFIC - BELGRADE		2421	142	12	485.4	5068.7	6	92	28.9	39.4	1.4	6.7	13.7
0004	400 JACKRABBIT LANE													
	BELGRADE	59714												
00006	LUZENAC AMERICA - THREE FORKS PLAN		3295	142	12	457.3	5081.0	25	92	19.8	4.1	0.2	15.5	0.7
0006	2150 BENCH ROAD													
	THREE FORKS	59752												
00008	MONTANA TALC MILL		3295	142	12	440.0	5071.5	15	92	5.8	1.6	0.2	5.0	0.2
0008	28769 SAPPINGTON RD													
	THREE FORKS	597520000												
00005	HOLNAM, INC.		3241	142	12	464.4	5088.0	22	92	130.0	30.4	4.9	1375.9	1.8
0005	4070 TRIDENT RD													
	THREE FORKS	59752												
00001	PIONEER READY MIX		2951	142	12	487.7	5067.1	4	92	7.8	4.4	5.9	8.4	1.5
0001	21730 HIWAY 10; NW OF BOZEMAN													
	BOZEMAN	59714												
00007	KANTA PRODUCTS		3255	142	12	456.0	5080.2	5	92	0.4	0.0	0.0	0.1	0.0
0007	WILLOW CREEK ROAD													
	THREE FORKS	59752												
	NUMBER OF PLANTS > 100 TONS PER YEAR									1	0	0	1	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									192.7	79.9	12.6	1411.6	17.9

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 035 GLACIER CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00004	MPC CUT BANK MAINLINE #1 STATION		1321	141	12	408.3	5383.8	10	92	1.3	53.0	0.0	170.8	9.2
0004	4 MILES SE OF CUT BANK													
	CUT BANK	59427												
00001	UNION OIL-CALIFORNIA		1311	141	12	389.2	5424.4	3	89	0.0	0.0	225.0	20.0	0.0
0001	P.O. BOX 298													
	CUT BANK	59427												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	1	1	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									1.3	53.0	225.0	190.8	9.2

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 039 GRANITE CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00002	CONTACT MINING COMPANY		1499	142	12	324.0	5131.8	1	92	0.2	0.0	0.0	0.0	0.0
0002	1/2 MILE SOUTH OF PHILLIPSBURG													
	PHILLIPSBURG	59858												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									0.2	0.0	0.0	0.0	0.0

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 043 JEFFERSON CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00003	MONTANA TUNNELS MINE		1041	142	12	412.5	5135.5	17	92	142.1	166.0	23.6	250.1	15.6
0003	PO BOX 176													
	JEFFERSON CITY	59638												
00001	ASH GROVE CEMENT		3241	142	12	429.0	5154.5	22	92	387.5	25.1	259.6	360.6	1.7
0001	100 HIGHWAY 518													
	CLANCY	596349701												
00002	GOLDEN SUNLIGHT MINE		1041	142	12	421.6	5083.0	19	92	914.7	534.1	38.8	352.5	24.4
0002	453 HWY 2 EAST													
	WHITEHALL	597590000												
	NUMBER OF PLANTS > 100 TONS PER YEAR									3	2	1	3	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									1444.3	725.2	322.0	963.2	41.7

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 047 LAKE CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	PACK RIVER LUMBER		9999	144	11	716.0	5284.8	9	89	0.0	71.0	0.0	6.0	4.0
0001	RTE 1, BOX 43													
	POLSON	000000000												
00002	PLUM CREEK - PABLO		2421	144	11	716.5	5276.9	10	89	0.0	58.0	182.0	67.0	20.0
0002	PO BOX 188													
	PABLO	59855												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	1	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									0.0	129.0	182.0	73.0	24.0

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 049 LEWIS AND CLARK CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	ASARCO - EAST HELENA		3332	142	12	429.5	5158.8	33	92	127.1	4.7	18251.0	504.7	1.6
0001	P.O. BOX 1230													
	EAST HELENA	59635												
00003	AMERICAN CHEMET		2819	142	12	429.0	5160.0	14	92	2.0	0.6	0.0	3.4	0.1
0003	SMELTER ROAD													
	EAST HELENA	59635												
00005	HELENA SAND & GRAVEL		2951	142	12	427.1	5162.7	4	92	5.4	1.0	1.9	0.9	0.7
0005	P.O. BOX 5960													
	HELENA	59604												
00006	BASIN CREEK MINE		1041	142	12	401.0	5141.5	16	92	11.5	31.8	5.5	83.1	6.1
0006	20 MILES SW OF HELENA													
	BASIN	59632												
	NUMBER OF PLANTS > 100 TONS PER YEAR									1	0	1	1	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									146.0	38.1	18258.4	592.1	8.5

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STATE: 30 MONTANA COUNTY: 053 LINCOLN CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	OWENS & HURST		2421	144	11	642.3	5419.7	2	92	44.2	0.0	0.0	0.0	0.0
0001	NORTH ON HIWAY 93													
	EUREKA	59917												
00002	PLUM CREEK MFG., LP-KSANKA		2421	144	11	655.3	5402.7	6	92	29.7	36.7	1.3	6.2	12.8
0002	PO BOX 28, HIWAY 93 N.													
	FORTINE	59918												
00003	ASARCO - TROY		1021	144	11	581.5	5345.6	5	92	22.2	2.8	0.7	6.6	0.5
0003	P.O. BOX 868													
	TROY	59935												
00004	CHAMPION - LIBBY		2436	144	11	607.8	5359.7	8	92	318.5	635.3	23.8	444.7	225.7
0004	952 E. SPRUCE ST.													
	LIBBY	59923												
00010	EUREKA PELLET MILLS		2421	144	11	642.0	5419.2	3	92	39.4	1.2	0.0	0.2	0.4
0010	P.O. BOX 667													
	EUREKA	59917												

	PM10	CO	SO2	NO2	VOC
NUMBER OF PLANTS > 100 TONS PER YEAR	1	1	0	1	1
TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)	454.0	676.0	25.8	457.7	239.4

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 057 MADISON CO

PLANT	NAME AND ADDRESS	SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	LUZENAC AMERICA - YELLOWSTONE MINE	3295	142	12	442.9	4991.4	11	92	53.5	108.8	7.3	67.2	4.7
0001	22 MILES SOUTH OF ENNIS												
	CAMERON 59720												
00002	MONTANA TALC - JOHNNY GULCH MINE	1496	142	12	442.5	4991.5	13	92	146.5	26.1	4.1	37.7	1.6
0002	4 MILES SOUTH CAMERON												
	ENNIS 59729												
00004	CHICAGO MINING CORP.	1041	142	12	429.7	5056.8	7	91	1.2	1.5	0.4	3.4	0.3
0004	P.O. BOX 555												
	PONY 59747												
00005	LUZENAC AMERICA INC. - ANTLER MINE	1499	142	12	359.0	5050.0	8	92	29.3	1.3	0.3	3.4	0.1
0005	SOUTH OF SILVER STAR												
	ALDER 59710												
00006	LUZENAC AMERICA INC. - ALDER PLANT	1499	142	12	410.0	5010.0	2	92	0.3	0.0	0.0	0.0	0.0
0006	ALDER PLANT												
	ALDER 59710												
00007	LUZENAC AMERICA INC. - BEAVERHEAD	1499	142	12	0.0	0.0	2	92	0.4	6.2	0.0	0.8	0.2
0007	BEAVERHEAD MINE												
	ALDER 49710												
	NUMBER OF PLANTS > 100 TONS PER YEAR								1	1	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)								231.2	143.9	12.1	112.5	6.9

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 059 MEAGHER CO

PLANT	NAME AND ADDRESS	SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	ALCOTECH, INC.	2869	142	12	515.1	5124.1	2	92	17.6	10.6	13.3	3.5	9.9
0001	P O BOX 158												
	RINGLING 59642												
	NUMBER OF PLANTS > 100 TONS PER YEAR								0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)								17.6	10.6	13.3	3.5	9.9

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 061 MINERAL CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	DAW FOREST PRODUCTS		4953	144	11	664.0	5223.0	2	92	38.5	66.0	2.4	11.2	23.1
0001	480 DIAMOND ROAD													
	SUPERIOR	59872												
00003	NORTHWEST LUMBER AND CEDAR		2421	144	11	644.5	5241.0	2	90	7.3	247.0	0.1	1.9	20.9
0003	P.O. BOX 417													
	ST. REGIS	59866												
00004	TRICON TIMBER INC.		2421	144	11	644.8	5241.4	2	92	8.6	37.0	1.3	25.9	12.9
0004	1 MILE NORTHEAST OF ST. REGIS													
	ST. REGIS	59866												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	1	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									54.4	350.0	3.8	39.0	56.9

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 063 MISSOULA CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00004	PYRAMID MTN LUMBER		2421	144	12	312.0	5226.7	8	92	93.6	109.0	4.0	76.3	38.1
0004	SOUTH EDGE OF TOWN													
	SEELEY LAKE	59868												
00006	STONE CONTAINER		2631	144	11	713.1	5204.6	34	92	569.9	3633.4	186.8	1969.8	861.6
0006	MULLEN ROAD													
	MISSOULA	598014707												
00008	MISSOULA WHITE PINE		2431	144	11	728.2	5196.7	18	92	21.2	15.4	1.1	10.8	5.4
0008	1301 SCOTT ST.													
	MISSOULA	598017009												
00009	AMERICAN ASPHALT		2951	144	11	724.9	5198.7	2	91	4.1	0.2	0.4	0.2	0.1
0009	MULLAN ROAD AT FLYNN LANE													
	MISSOULA	59802												
00011	MISSOULA COUNTY ASPHALT PLANT		2951	144	11	725.6	5198.9	2	92	0.9	0.0	0.0	0.0	0.0
0011	STOCKYARD AND RESERVE													
	MISSOULA	598020000												
00002	LOUISIANA-PACIFIC		2493	144	11	726.4	5198.6	29	92	116.1	48.3	1.7	17.2	16.2
0002	3300 RASER DRIVE													
	MISSOULA	59802												
00012	JENSEN PAVING CO.		2951	144	11	725.9	5198.9	2	92	24.3	0.7	1.4	0.7	0.5
0012	GRANT CREEK PIT													
	MISSOULA	59806												
00001	CHAMPION-BONNER		2421	144	12	281.5	5194.8	4	92	109.1	308.3	11.5	215.8	107.9
0001	HIGHWAY 200 EAST													
	BONNER	59823												
00007	WESTERN MATERIALS - TARGET RANGE		2951	144	11	722.9	5191.9	5	92	12.5	0.0	0.0	0.2	0.0
0007	3800 40TH AVENUE													
	MISSOULA	59801												
00013	WESTERN MATERIALS - GRANT CREEK SI		5082	144	11	725.1	5198.9	5	92	29.1	1.6	3.0	1.5	1.1
0013	2700 MICHAEL ROAD													
	MISSOULA	59801												
	NUMBER OF PLANTS > 100 TONS PER YEAR									3	3	1	2	2
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									980.8	4116.9	209.9	2292.5	1030.9

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STATE: 30 MONTANA COUNTY: 067 PARK CO

PLANT	NAME AND ADDRESS	SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	BRAND S LUMBER	2421	142	12	534.0	5053.0	5	92	31.0	20.3	1.0	17.2	0.8
0001	1 MI. SE OF I90 & US89 INTRCHG												
	LIVINGSTON 590470000												
00002	PARK COUNTY INCINERATOR	4953	142	12	535.4	5058.6	1	92	10.0	24.3	12.1	31.4	10.7
0002	328 NORTH M STREET												
	LIVINGSTON 59047												
00003	PARK LUMBER COMPANY, INC.	2421	142	12	536.0	5058.0	2	92	8.4	238.0	0.1	1.8	20.1
0003	1.5 MILES EAST OF LIVINGSTON												
	LIVINGSTON 59047												
00004	TVX - MINERAL HILL MINE	1041	142	12	530.0	4990.5	12	92	5.0	17.6	1.9	18.1	1.6
0004	P.O. BOX 92												
	GARDINER 59030												
	NUMBER OF PLANTS > 100 TONS PER YEAR								0	1	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)								54.4	300.2	15.1	68.5	33.2

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STATE: 30 MONTANA COUNTY: 071 PHILLIPS CO

PLANT	NAME AND ADDRESS	SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00002	ZORTMAN MINING, INC. (LANDUSKY)	1041	143	12	678.5	5310.0	13	92	545.2	363.0	36.3	330.1	14.5
0002	PO BOX 313												
	ZORTMAN 59546												
00001	ZORTMAN MINING, INC. (ZORTMAN)	1041	143	12	683.1	5311.3	13	92	24.3	5.3	0.3	4.4	0.3
0001	P.O. BOX 313												
	ZORTMAN 595460000												
	NUMBER OF PLANTS > 100 TONS PER YEAR								1	1	0	1	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)								569.5	368.3	36.6	334.5	14.8

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STATE: 30 MONTANA COUNTY: 073 PONDERA CO

PLANT	NAME AND ADDRESS	SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	BUSCH AGRICULTURAL RESOURCES, INC.	5153	141	12	429.0	5334.0	5	92	2.8	0.0	0.0	0.0	0.0
0001	HIGHWAY 91 AND FRONT STREET												
	CONRAD 59425												
	NUMBER OF PLANTS > 100 TONS PER YEAR								0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)								2.8	0.0	0.0	0.0	0.0

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 077 POWELL CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	COMINCO FERTILIZERS		1475	142	12	361.7	5165.3	14	92	102.2	1.1	0.3	109.6	0.6
0001	P.O. BOX 638													
	GARRISON	59731												
00002	LOUISIANA-PACIFIC CORP.		2421	142	12	366.0	5138.5	9	92	48.8	327.2	2.5	17.0	39.5
0002	KENTUCKY AVENUE													
	DEER LODGE	59722												
	NUMBER OF PLANTS > 100 TONS PER YEAR									1	1	0	1	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									151.0	328.3	2.8	126.6	40.1

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STATE: 30 MONTANA COUNTY: 081 RAVALLI CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	STOLTZE-CONNER LUMBER COMPANY		2421	144	11	720.3	5095.7	9	92	10.3	3.0	0.1	0.5	1.0
0001	P.O. BOX 410													
	DARBY	59829												
00002	DARBY LUMBER, INC.		2421	144	11	718.5	5101.1	9	92	77.1	38.1	1.4	6.4	13.3
0002	HIWAY 93 NORTH DARBY													
	DARBY	59829												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									87.4	41.1	1.5	6.9	14.3

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 083 RICHLAND CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	COASTAL OIL & GAS		2911	143	13	570.0	5279.9	2	92	0.0	0.5	279.5	3.8	0.1
0001	P.O BOX 1589													
	SIDNEY	59270												
00003	MDU - SIDNEY		4911	143	13	563.4	5280.7	1	92	23.1	53.3	717.1	710.6	6.2
0003	114 N CENTRAL AVE													
	SIDNEY	59270												
00002	HOLLY SUGAR CORPORATION		2063	143	13	564.9	5285.0	9	92	56.0	180.4	121.2	327.6	45.6
0002	P.O. BOX 1168													
	SIDNEY	59270												
00005	KNIFE RIVER COAL		1211	143	13	543.0	5257.5	11	92	76.8	23.4	1.1	14.0	2.0
0005	NEAR SAVAGE													
	SAVAGE	59262												
00006	WESTERN GAS RESOURCES-FAIRFIELD GA		4922	143	13	561.3	5305.1	8	92	0.0	182.4	75.0	195.6	38.9
0006	ROUTE 1, BOX 1430													
	FAIRVIEW	59221												
00007	WESTERN GAS RESOURCES-RICHLAND STA		4922	143	13	551.9	5291.4	2	92	0.1	7.5	0.0	59.5	1.4
0007	SEC. 8, T23N, R58E													
	FAIRVIEW	59221												
00008	KOCH-N. YELLOWSTONE STATION		4922	143	13	556.0	5290.0	3	92	0.5	23.6	0.0	187.0	4.5
0008	NORTH EAST OF SIDNEY													
	SIDNEY	59270												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	2	3	4	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									156.5	471.1	1193.9	1498.1	98.7

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 087 ROSEBUD CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00009	BIG SKY COAL COMPANY		1211	143	13	376.0	5075.0	16	92	177.3	80.3	8.4	99.1	11.9
0009	P.O. BOX 97													
	COLSTRIP	59323												
00011	ST. LABRE INDIAN SCHOOL		9999	143	13	400.2	5051.0	2	92	48.3	29.7	1.1	5.0	10.4
0011	P.O. BOX 48													
	ASHLAND	59003												
00004	WESTERN ENERGY		1211	143	13	375.0	5081.0	37	92	1174.3	518.7	42.5	505.8	64.6
0004	ROSEBUD MINE													
	COLSTRIP	59323												
00010	NORTHERN CHEYENNE PINE CO		2421	143	12	400.5	5049.9	12	92	90.9	33.6	1.2	5.7	11.7
0010	HIGHWAY 212 WEST													
	ASHLAND	59003												
00007	ROSEBUD POWER PLANT		4911	143	13	371.5	5092.6	1	92	1.4	6.4	1138.1	669.9	9.1
0007	P.O. BOX 189													
	COLSTRIP	59323												
00008	MPC - COLSTRIP 1-4		4911	143	13	374.3	5082.2	5	92	526.4	2944.1	10504.0	42382.0	343.4
0008	P.O. BOX 38													
	COLSTRIP	59323												
00012	AGRI SYSTEMS		2421	143	12	400.5	5049.8	3	92	9.8	3.1	0.1	0.5	1.0
0012	HIGHWAY 212													
	ASHLAND	59003												
	NUMBER OF PLANTS > 100 TONS PER YEAR									3	2	2	3	1
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									2028.4	3615.9	11695.4	43668.0	452.1

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 089 SANDERS CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00003	THOMPSON RIV LUMBER		2421	144	11	631.3	5270.8	8	92	45.0	11.7	0.4	2.0	4.1
0003	P.O. BOX 279													
	THOMPSON FALLS	598730000												
00004	W.I. FOREST PRODUCTS		2421	144	11	626.2	5271.7	14	92	26.1	55.5	2.0	9.4	19.4
0004	5196 HWY 200													
	THOMPSON FALLS	59873												
00005	WATTERS BROTHERS LUMBER		2421	144	11	621.4	5274.3	4	89	0.0	3.0	0.0	0.0	0.0
0005	P.O. BOX 666													
	THOMPSON FALLS	59873												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									71.1	70.2	2.4	11.4	23.5

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STATE: 30 MONTANA COUNTY: 091 SHERIDAN CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	KOCH - CLEAR LAKE STATION		4922	143	13	551.0	5358.1	1	92	0.0	3.8	0.0	30.6	0.7
0001	SECTION 17, T33N, R58E													
	DAGMAR	59219												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									0.0	3.8	0.0	30.6	0.7

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STATE: 30 MONTANA COUNTY: 093 SILVER BOW CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00006	RITEWAY ASPHALT		2951	142	12	379.9	5093.8	1	92	0.2	0.0	0.0	0.0	0.0
0006	700 CENTENNIAL AVE.													
	BUTTE	59701												
00007	BUTTE-SILVER BOW ASPHALT PLANT		2951	142	12	379.9	5093.8	3	92	0.7	1.7	3.4	1.6	1.3
0007	500 CENTENNIAL AVENUE													
	BUTTE	59701												
00008	GILMAN EXCAVATING		2951	142	12	385.3	5096.3	2	92	0.0	0.2	0.5	0.2	0.2
0008	1488 CONTINENTAL													
	BUTTE	59701												
00011	BEAL MOUNTAIN MINE		1041	142	12	354.5	5091.5	19	92	90.6	64.1	12.5	115.1	8.1
0011	1800 FAIRMONT ROAD													
	ANACONDA	597110000												
00005	RHONE-POULENC BASIC CHEMICALS CO.		2819	142	12	370.2	5094.5	27	92	178.0	41.1	336.2	247.7	2.4
0005	NEAR RAMSAY													
	SILVER BOW	59750												
00009	MONTANA RESOURCES		1021	142	12	383.2	5096.6	21	92	1136.1	361.1	48.3	400.5	41.1
0009	600 SHIELDS AVENUE													
	BUTTE	59701												
00013	MSE -CDIF SITE		8733	142	12	382.3	5087.1	5	92	1.6	27.0	0.2	18.2	0.0
0013	BUTTE INDUSTRIAL PARK													
	BUTTE	59701												
00012	BLANKENSHIP CONSTRUCTION		1611	142	12	381.0	5098.0	2	92	8.6	0.0	0.1	0.0	0.0
0012	P.O. BOX 460													
	BUTTE	59703												
	NUMBER OF PLANTS > 100 TONS PER YEAR									2	1	1	3	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									1415.8	495.2	401.2	783.3	53.1

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STATE: 30 MONTANA COUNTY: 095 STILLWATER CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00002	STILLWATER MINING CO. SMELTER		3339	140	12	637.5	5054.8	1	92	4.0	0.0	5.0	0.3	0.0
0002	P.O. BOX 1209													
	COLUMBUS	59019												
00001	STILLWATER MINING COMPANY		1099	140	12	588.0	5026.0	11	92	38.9	43.4	4.8	52.9	4.0
0001	STAR ROUTE 2, BOX 365													
	NYE	59061												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									42.9	43.4	9.8	53.2	4.0

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STATE: 30 MONTANA COUNTY: 099 TETON CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00002	BUSCH AGRICULTURAL RESOURCES, INC.		5153	141	12	426.0	5272.6	3	92	11.6	0.0	0.0	0.0	0.0
0002	233 WEST MAIN													
	FAIRFIELD	59436												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									11.6	0.0	0.0	0.0	0.0

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STATE: 30 MONTANA COUNTY: 101 TOOLE CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00001	NORTHERN MONTANA GAS		4922	141	12	441.3	5393.6	1	91	0.0	0.0	94.1	0.0	0.0
0001	P.O. BOX 716													
	SHELBY	594740000												
00003	NORTHERN EXPRESS TRANSPORTATION AU		4789	141	12	437.3	5372.0	2	92	0.4	0.0	0.0	0.0	0.0
0003	301 FIRST STREET SOUTH													
	SHELBY	59474												
00004	MPC - SHELBY-KEVIN SUNBURST STATIO		4922	141	12	446.0	5382.5	1	92	0.0	2.7	0.0	11.0	0.5
0004	8 MILES NE OF SHELBY													
	SHELBY	59474												
00005	BEARPAW GATHERING SYSTEMS, INC.		4922	141	12	441.8	5390.5	3	92	0.0	1.5	0.0	2.3	0.3
0005	8 MILES EAST OF KEVIN													
	KEVIN	59454												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									0.4	4.2	94.1	13.3	0.8

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STATE: 30 MONTANA COUNTY: 109 WIBAUX CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00002	SWEPI - S. PINE ENGINE		4922	143	13	536.6	5170.8	1	92	0.2	25.8	2.1	7.5	2.2
0002	SEC. 23, T11N, R57E													
	BAKER	59313												
00001	SWEPI - S. PINE GCF		1311	143	13	535.4	5174.3	2	92	0.0	0.0	15.4	0.2	0.0
0001	SEC. 10, T11N, R57E													
	BAKER	593131324												
	NUMBER OF PLANTS > 100 TONS PER YEAR									0	0	0	0	0
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									0.2	25.8	17.5	7.7	2.2

DATE : 07/29/93 AFS COUNTY POINT SOURCE SUMMARY PGM: AFP649

STATE: 30 MONTANA COUNTY: 111 YELLOWSTONE CO

PLANT	NAME AND ADDRESS		SIC	AQC	UTZ	UTMH	UTMV	TOTAL # OF POINTS	YR	PM10	CO	SO2	NO2	VOC
00002	MIDLAND O'LEARY, INC		2951	140	12	686.0	5069.0	2	92	1.6	0.0	0.0	0.0	0.0
0002	SHILO RD & KING AVE WEST													
	BILLINGS	59107												
00007	WESTERN SUGAR		2063	140	12	694.6	5070.2	13	92	53.0	256.7	431.9	356.0	17.2
0007	3020 STATE AVE													
	BILLINGS	59101												
00010	EMPIRE SAND & GRAVEL CO.		1611	140	12	701.0	5081.5	2	92	10.2	0.0	1.7	0.1	0.0
0010	PIONEER ROAD, 5 MILES NE BLGS													
	BILLINGS	59103												
00011	CONOCO		2911	140	12	695.0	5072.7	26	92	114.8	113.5	2215.6	793.2	722.9
0011	401 S 23RD ST													
	BILLINGS	59103												
00012	CENEX		2911	140	12	674.0	5058.0	46	92	259.3	152.3	8533.3	1136.6	2733.0
0012	US 212, SOUTH OF LAUREL													
	LAUREL	59044												
00013	EXXON CO USA		2911	140	12	699.5	5076.5	18	92	319.6	90.3	10041.0	2850.4	2022.1
0013	700 EXXON ROAD													
	BILLINGS	591031163												
00014	MONTANA SULFUR & CHEMICAL		2819	140	12	700.0	5076.0	3	92	0.3	261.1	3326.8	18.1	0.3
0014	EAST FRONTAGE ROAD													
	BILLINGS	59103												
00015	MPC - CORETTE/BIRD POWER PLANTS		4911	140	12	696.0	5072.0	3	92	124.0	230.6	9012.0	3612.1	26.7
0015	PO BOX 30495													
	BILLINGS	59107												
00006	CEREAL FOOD PROCESSORS, INC.		2041	140	12	693.3	5071.8	7	92	13.4	0.0	0.0	0.2	0.0
0006	3601 FIRST AVE. SOUTH													
	BILLINGS	59101												
00016	JUPITER SULFUR, INC.		2873	140	12	695.4	5072.2	3	92	0.0	0.0	56.2	17.3	0.1
0016	2201 7TH AVENUE SOUTH													
	BILLINGS	59107												
00022	R.L. SCHAFF CONCRETE		3273	140	12	706.1	5086.9	2	92	1.1	0.0	0.0	0.0	0.0
0022	5444 CHICAGO ROAD													
	BILLINGS	59105												
	NUMBER OF PLANTS > 100 TONS PER YEAR									4	5	6	5	3
	TOTAL COUNTY POINT SOURCE EMISSIONS (TONS/YR)									897.3	1104.5	33618.5	8784.0	5522.3